Oct. 28, 1969 R. MORONEY ETAL 3,474,595

APPARATUS FOR PORTION PACKAGE SEALING

Filed June 22, 1965 2 Sheets-Sheet 1

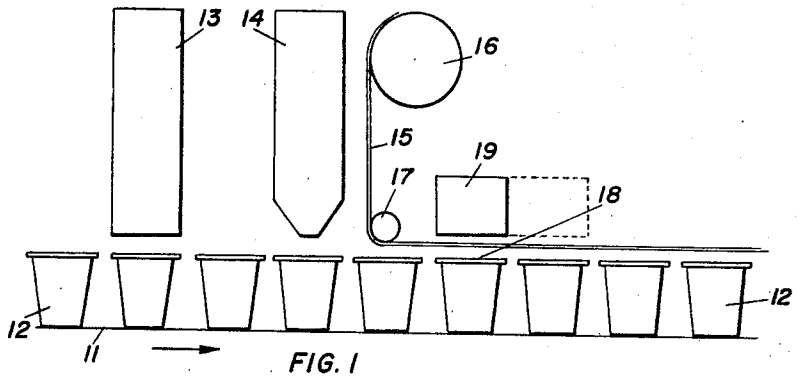


FIG. 1

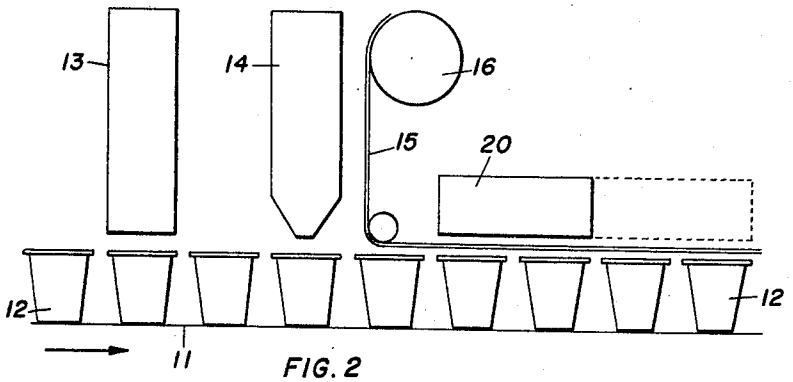


FIG. 2

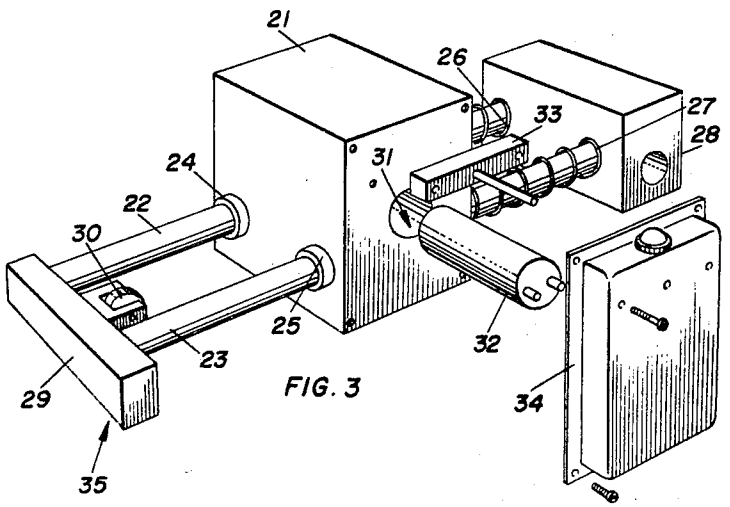


FIG. 3

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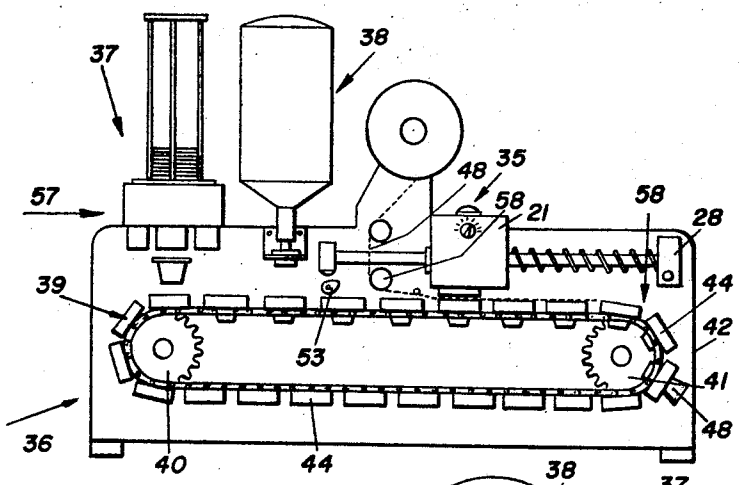


FIG. 4

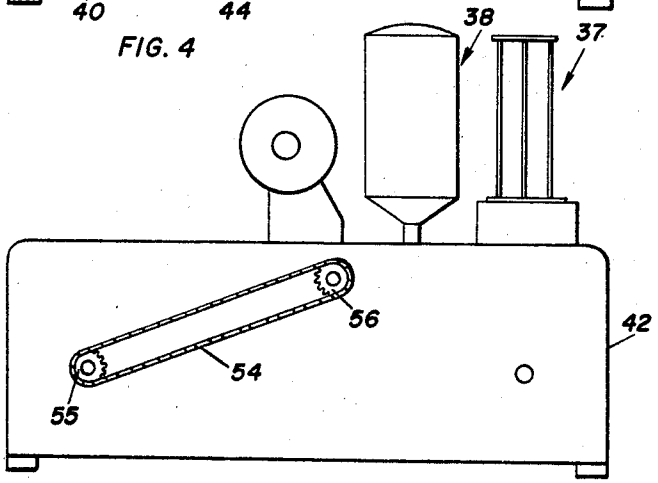


FIG. 5

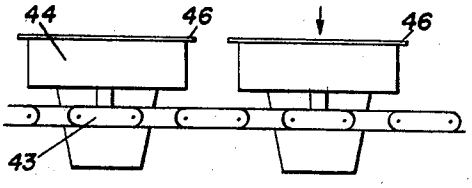


FIG. 7

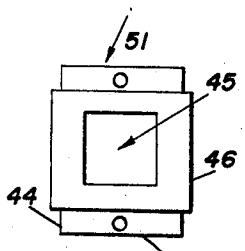


FIG. 8

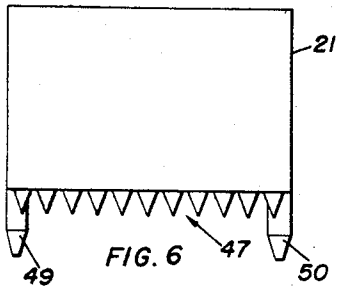


FIG. 6

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APPARATUS FOR PORTION PACKAGE SEALING

Ronald Moroney and Paul Johansen, both of Toronto, Ontario, Canada, and Heinz Schwenzer, 2440 Keele St., Apt. 9B, Toronto 15, Ontario, Canada; said Moroney and said Johansen assignors to said Schwenzer

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Int. Cl. B65b 51/14, 61/12
U.S. Cl. 53—373 1 Claim

ABSTRACT OF THE DISCLOSURE

The invention is directed to an apparatus whereby containers are sealed at a rate commensurate with the rate at which the containers are filled by effecting the sealing during the movement of the containers as they are indexed from station to station.

This invention relates to improvements in methods and apparatus for sealing portion packages.

In recent times the use of portion packages, that is, the use of portions of food such as for instance cream, jam, and the like, prepackaged for delivery and consumption, has come into extensive general use. Heretofore, reliance has been placed upon the usual methods of packaging, that is, to provide treated paper packages into which the portion foods have been placed. More recently however, plastic containers, usually vacuum formed, have been introduced and used for portion packaging of foods.

One problem associated with providing portion packages is the problem of filling the packages and sealing same. Heretofore, it has been usual practice to provide small containers of the required size which are adapted for fitting with a snap-in or snap-on cap. Other designs however utilize a sealing film which is preferably heat sealed over the open portion of the container. This has the effect of reducing the cost of the sealing cap since it is much cheaper to provide the seal in strip or film form as opposed to individual cap members. For this reason the film or strip type of sealing closure is generally preferred over the individual cap or type of closure member.

The particular problem associated with this general problem of filling and sealing is the problem of output per person per machine for a particular portion package. Inasmuch as the cost of the package and the package materials and the cost of the food or other being packaged are fixed relative to a particular situation, the labour involved in packaging then becomes the controllable variable in the cost and pricing of the portion packages. For this reason the output of a particular machine relative to its size and cost is of importance when considering the profit structure of a particular venture.

A further inward consideration is to be found in the nature of the particular product being packaged. In this regard it should be noted that primarily the limiting factor on the particular speed of packaging devices is limited by the nature of the food or other product which is being packaged. Thus, for certain types of foods there is a certain rate of dispensing which cannot be exceeded and considering a station to station type of packaging system there is a certain acceleration from station to station which must be observed and which is dictated by the particular type of food being packaged. Due to these considerations, it is of importance to provide means for handling the containers and the sealing thereof in such a manner as to be more expeditious than the limiting conditions imposed by the particular product being packaged.

Accordingly, it is an object of the present invention to provide a method and apparatus therefor whereby portion containers can be sealed at a rate commensurate with the rate at which the containers can be filled with portions of food or other substances. The invention accomplishes this aim by providing a method whereby the closure of the individual containers is effected during movement of the containers as they are indexed from station to station.

Other objects and features of the invention will be apparent from the following detailed description and accompanying drawings in which like numerals refer to like parts throughout the various views.

In the drawings:

FIGURE 1 is a diagrammatic representation of the method according to the present invention;

FIGURE 2 is a diagrammatic representation of a method in variation of the method as illustrated in FIGURE 1;

FIGURE 3 is a perspective, exploded view of apparatus according to the present invention;

FIGURE 4 is a side elevation of the apparatus as illustrated in FIGURE 3 mounted on a portion packaging machine;

FIGURE 5 is a side elevation of the opposite side of the machine as shown in FIGURE 4;

FIGURE 6 is a view on one end of a heater block according to the present invention;

FIGURE 7 is an enlarged detail side elevation of the endless link belt utilized with the present invention; and

FIGURE 8 is a view on top of a particular link of the belt as shown in FIGURE 7 and illustrating the cavity therein for supporting a portion container.

With reference to FIGURE 1, the general method of the invention is illustrated wherein a belt such as the belt or support means **11** supports a plurality of portion containers **12** thereon. A portion container dispensing device **13** is positioned as shown and a food filling means **14** is provided whereby food can be portioned into the individual containers **12**. A strip of heat sealable material **15** from the roll **16** is provided to be placed in contact with the tops of the containers **12**, so guided by means of a roller **17** or other suitable means. It is important to note at this point that the container dispenser **13**, the food filling means **14**, and the strip **15** are well known in the art of packaging and for this reason such are not described here in detail. Thus, it is possible to provide any one of several well known devices for accomplishing these individual steps in the complete portion packaging system or method. As will be hereinafter pointed out in detail, the present invention is directed towards a method and apparatus for sealing such containers and not with the filling or dispensing of same.

The sealing film **15**, which is of a heat sensitive type is secured to the tops of the containers as at **18** and sealed thereon by the application of heat by means of the heater block **19**. The heater block or heater unit **19** is lowered onto the strip **15** pushing same into contact with the container **12** and sealing these two together while the support means **11** is moving. Thus during the interval of indexing, common to such portion packaging machines, advantage is taken to seal the heat sensitive strip to the container thereby to provide a sealed package.

In FIGURE 2 a modification of this general method is shown wherein a heat sealing unit **20** is provided which covers two such containers **12**. It will be understood that the unit **20** could also be made to cover more than two containers, the number of containers being covered depending upon the speed with which the line is being operated together with the required time for heat sealing of the strip to the container. Thus if the required time for heat sealing was four times the required time for dispensing and indexing of the portion container then a heat

sealing unit, sealing four containers at a time would be required to maintain the line speed.

With reference to FIGURE 3, FIGURE 4, FIGURE 5, FIGURE 6, FIGURE 7, and FIGURE 8 apparatus according to the present invention is illustrated. A heat sealing unit or sealing block **21** is slidably positioned on a pair of arms **22** and **23** to be biased against the collars **24** and **25** by means of the springs **26** and **27**. A pivot block **28** secures one end of the arms **22** and **23** and an end block **29** secures the other ends of the arms and supports a roller **30** thereon. The heater block **21** is provided with a recess as at **31** into which can be secured the heating element **32**. An operational thermostat **33** is secured adjacent to the heater block **21** and a cover **34** is provided to secure same and protect internal wiring thereof.

In FIGURE 4 the heater block assembly indicated generally as **35** is shown mounted onto a portioned packaging machine indicated generally as **36**. In this machine a container dispensing unit is shown at **37** and a portion food dispensing or filling means **38** is mounted as shown. As has been stated these devices are well known in the art and many forms of them are available commercially and for this reason these devices are not described in detail in this specification.

An endless link belt **39** is mounted on the sprockets **40** and **41**, these sprockets being rotatably supported on the frame **42** of the machine **36** and driven in unison with the drive which operates the container dispenser **37** and the food filling means **38**. In this regard it should be noted that such drive mechanisms for operating these devices in unison and according to an indexing device are well known in the art. Other machines are presently available which include these devices and to one skilled in the art the provision of in unison indexing of the link belt **39** compatable with the dispensing and filling means is a comparatively simple adaptation.

The link belt **39** is composed of a plurality of separate links as illustrated in FIGURE 7. A conventional type of chain **43** is provided to which is secured a plurality of links **44**, these links having a cavity as at **45** therein for reception of individual portion containers these containers being in this case provided with a rim as at **46**. For the use of a heat sealable film or strip the rim **46** should be comparatively flat in order to provide a positive contracting surface for the sealing strip. However, various configurations of the lip or flange **46** of the container could be resorted to depending upon the particular requirements as to design and intended use of the container. Thus the container as shown in illustrated for the purpose of explaining the general method according to the invention.

With further reference to FIGURE 6, it will be seen that the heater block **21** is provided with a plurality of perforating needles as at **47** which perforate the strip of heat sealable film **48**, as shown in FIGURE 4, whereby upon the individual links **44** passing about the sprocket **41** and separating due to increased circumferential distances the film is severed or parted, thereby to release individual sealed portion packages. These packages as at **48** can be handled and counted and packaged according to anyone of several very well known methods for handling individual articles. Thus it is not the intention of this disclosure to provide means for handling these articles but to provide a method and apparatus for sealing portion containers.

A pair of locating pins **49** and **50** are provided projecting below the heater block **21** and are adapted to fit into the locating holes as at **51** and **52** of the link **44**. Thus upon the heater block **21** dropping onto a particular link **44** the locating means **49** and **50** will position the block relative to the link and thus relative to the container within the link cavity and thus aligning the heater block with the filled container. In this regard it should be noted that other means may be resorted to for aligning the heater block with a particular link of the belt and that the means shown are done so by way of example only.

The means for contacting and removing the heater block **21** with a particular link **44** is illustrated in FIGURE 4 and FIGURE 5 wherein a cam **53** is rotatably mounted on the frame **42** and is operably connected with sprocket **41** by means of the chain drive **54** monnecting the other sprockets **55** and **56**. At this point it should be noted that although the sprockets **55** and **56** are shown as being equal in diameter this is not necessarily the case since the relative speed of the sprocket **41** and the rotation of the cam **53** would be fixed for a particular machine design and for this reason the sprockets **55** and **56** are shown as being equal by way of example only.

In operation the apparatus as shown is powered by one of several well known drive means for such machines and the container dispenser **37** provides containers into the individual links **44** of the belt **39** and the food filling means **38** fills the containers. The heat sensitive sealing cap in the form of the film **48**, which has been secured by heat sealing to the previous containers is pulled by action of the belt rotating and removing in the direction of the arrow as indicated at **57** under the roller **58** to come in close contact with the individual containers **46**. Rotation of the cam drops the sealing unit **21** onto the individual container and strip and the pins **49** and **50** locating within the holes **51** and **52** move the unit **21** against the force of the springs **26** and **27**, whereby the strip is sealed onto the top of the filled container to provide a portion package. The cam then lifts the heater block **21** from in contact with the sealed container and the springs **26** and **27** return the block **21** to a start position which is in abuttment with the stops **24** and **25**.

Upon the heater block **21** dropping onto the tape or film **48** the perforating pins or needles **47** perforate the tape wherein upon the individual containers being moved about the periphery of the sprocket **41** these are separated by an increase in the circumferential spacing as indicated by the arrow **58**.

The thermostat **33** operates to control the heat of the block **21**, the heater **32** being of electrical nature providing the heat. The means for connecting and controlling such things are well known in the art and for this reason are not shown or described in detail here since these would be obvious to any workmen skilled in such matters.

From the foregoing it will be seen that the present invention provides a method whereby filled portion containers can be sealed, such sealing taking place during the interval of time in which the containers are indexed according to general practice and that the sealing may take place singly or in plurality according to the time requirements for a particular filling line. The invention also provides apparatus to accomplish the above method this apparatus being disclosed herein by way of preferred example only. Thus other designs for apparatus could be incorporated and still remain within the scope and spirit of the invention.

It should be further understood that although specific embodiments of the invention have herein been described and illustrated, the invention also contemplates such variations as may fall within the scope of the appended claim.

The embodiments of the invention of which an exclusive property or privilege is claimed are defined as follows:

1. A sealing device for use with a portion packaging machine wherein a container dispenser issues containers and filling means are provided for dispensing portions into said containers, and a heat sealable strip is provided for sealing over said filled containers, said device comprising: an endless link belt supported for horizontal movement and passing about at least one drive sprocket, said belt having links each of which defines portion container supporting means therein; means for connecting said belt,

in unison with said dispenser and said filling means; a heat sealing block slidably supported above said link belt and slidable in a direction parallel with said belt, said block being yieldably biased in a direction opposite to the direction of travel of said belt; and means for intermittently contacting said block with said belt including means for perforating said strip between said containers, whereby upon said block being in contact, said strip will be heat sealed to said containers, and upon said belt passing about said drive sprocket said containers will be separated by said strip parting at said perforating due to circumferential spacing increase between said links.

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TRAVIS S. McGEHEE, Primary Examiner

U.S. Cl. X.R.

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