May 7, 1968 C. W. VOGT 3,381,445

PACKAGE FORMING APPARATUS

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FIG. 1

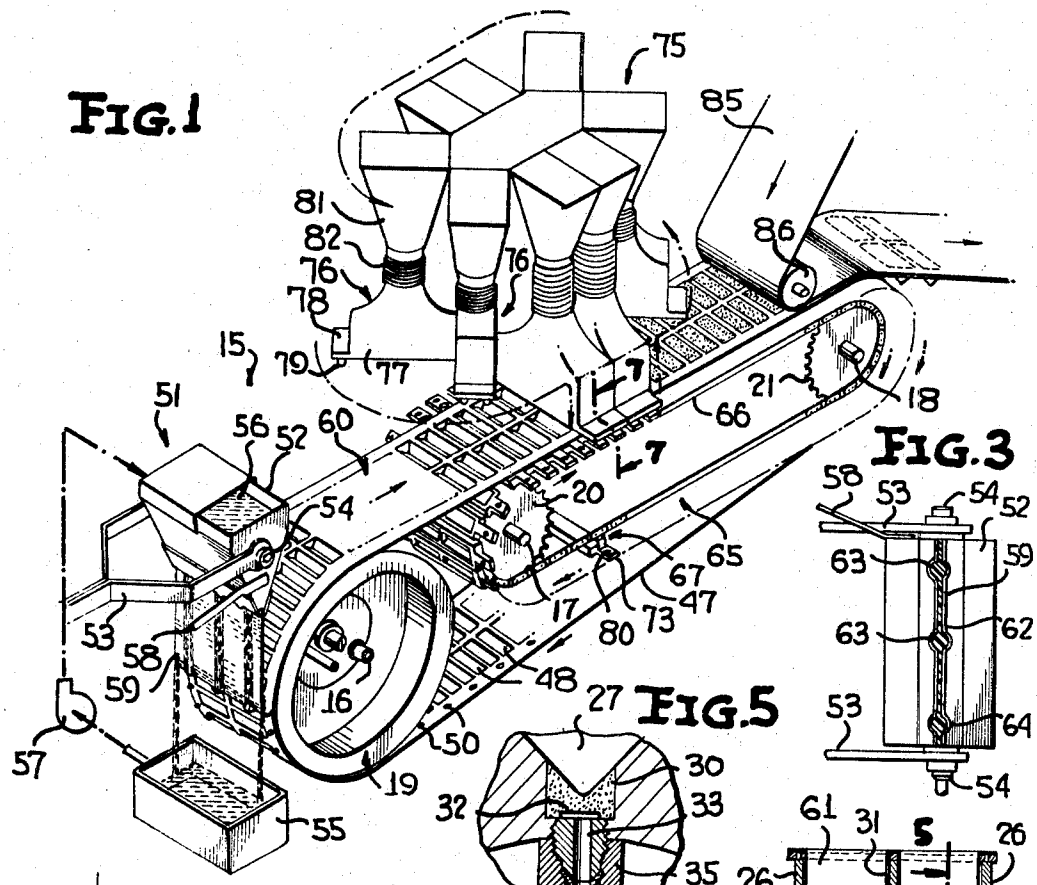
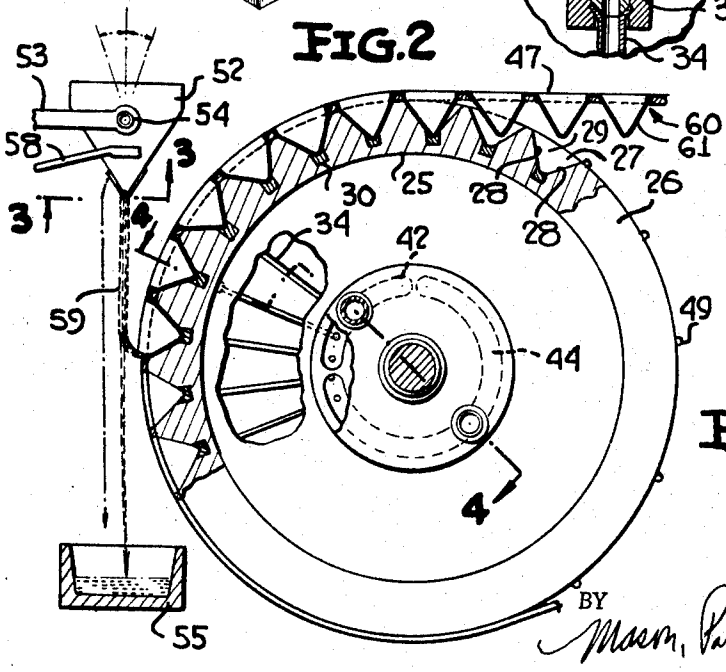


FIG. 3

FIG. 5

FIG. 2



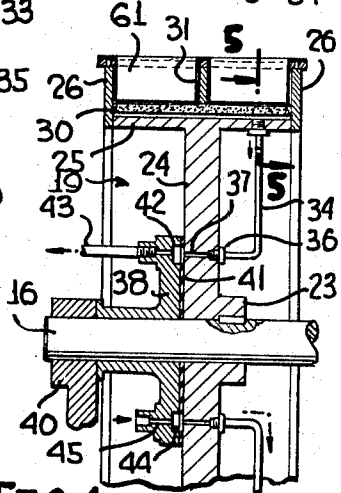


FIG. 4

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PACKAGE FORMING APPARATUS

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FIG. 6

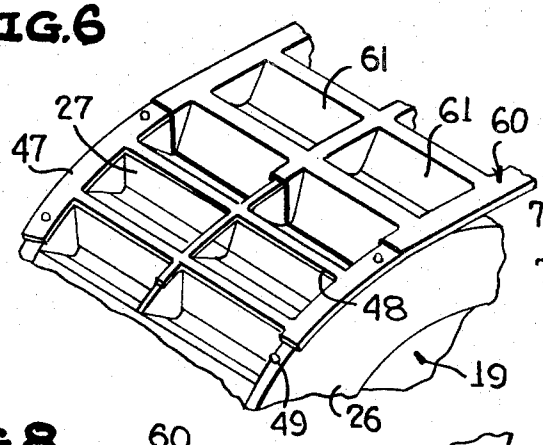


FIG. 7

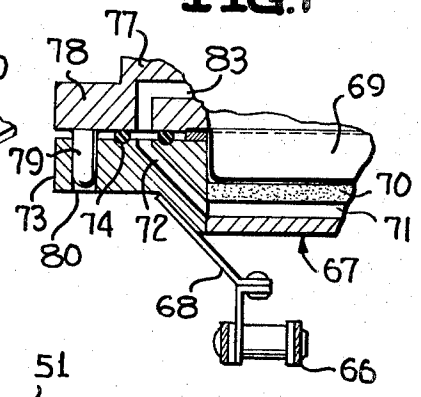


FIG. 8

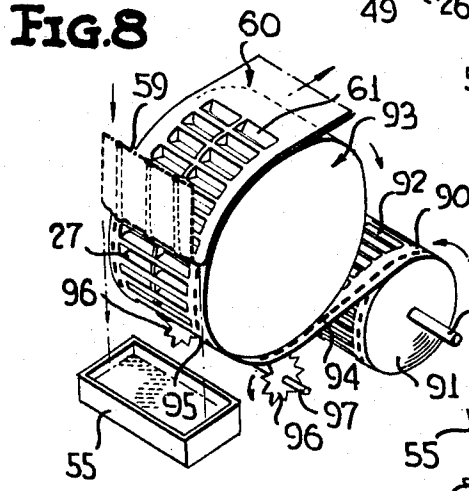


FIG. 9

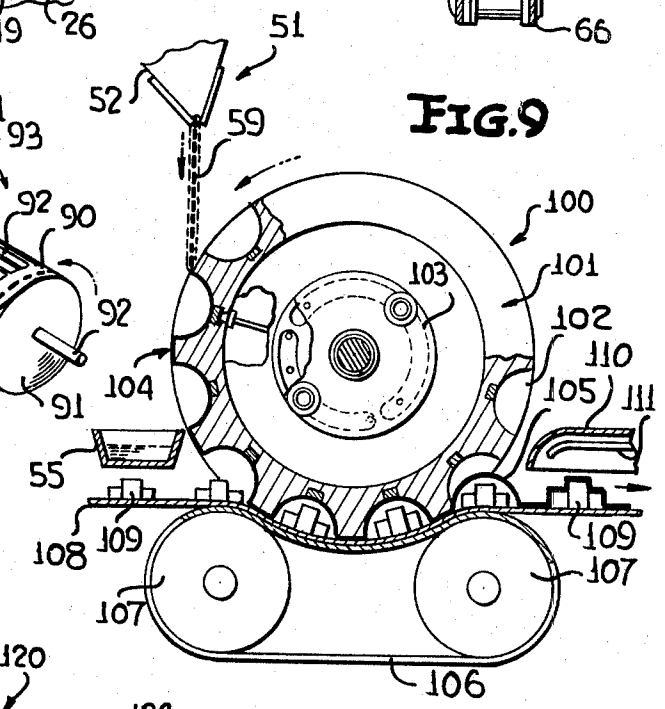
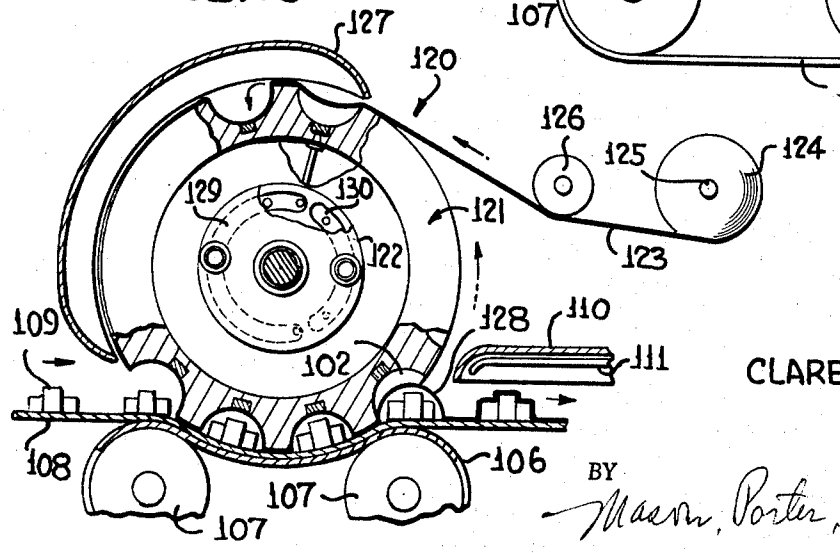


FIG. 10



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3,381,445

PACKAGE FORMING APPARATUS

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16 Claims. (Cl. 53—140)

ABSTRACT OF THE DISCLOSURE

This disclosure relates to a method of forming packages wherein a flowing curtain of web forming material is directed against the peripheral surface of a pocketed drum to form a continuous pocketed web. Thereafter, the web is associated with moving fillers of the pressure differential type and the pockets of the web filled with a pulverulent material. A cover web is then secured to the filled pocketed web to seal the pockets.

This invention relates in general to new and useful improvements in packaging apparatus and more specifically to a packaging apparatus which is capable of operating on a continuous basis.

This invention particularly relates to a novel packaging apparatus wherein a continuous pocketed web is formed and in a continuous motion combined with another web to effectively seal the pockets thereof with there being positioned within each pocket the product to be packaged.

A primary object of this invention is to form a continuous pocketed web by utilizing a rotating drum having pocket defining recesses formed in the peripheral surface thereof, and applying to the peripheral surface of the drum or to a carrier entrained thereabout a falling screen of web forming material which solidifies as it strikes the drum or the carrier and is simultaneously drawn into the recesses of the drum to form the pockets in the web.

Another object of this invention is to provide a continuously operating apparatus for forming a pocketed web, filling the pockets of the web and then sealing the pockets, the apparatus including a rotating drum having a peripheral surface with recesses formed therein for defining pockets, a carrier passing around the drum, an apparatus for delivering a falling screen of web forming material to the carrier whereby a web is automatically formed on the carrier and major portions of the web are drawn into the recesses of the drum to form pockets in the web, and there being later associated with the web and carrier support units configurated to receive the pockets of the web and retain the shape thereof, and filling units overlying the support units and movable together with the web and the support units to automatically fill the pockets in the web, and there further being provided means for applying a covering web to the filled pocketed web to seal off the individual pockets.

Another object of this invention is to provide a novel apparatus of the foregoing type wherein the carrier is in the form of a perforated web to which the newly formed pocketed web is bonded and which perforated web becomes a part of the final package.

Anothe object of this invention is to provide an apparatus of the foregoing type wherein the support units are constructed to tightly draw the material of the pockets thereinto with the necessary vacuum being supplied by associated ones of the filler units.

Still another object of this invention is to provide a novel packaging apparatus which includes a continuous web on which articles to be packaged are positioned, and a pocketed web which is applied in overlying relation to both the continuous web and the articles and sealed to the continuous web surrounding the articles, and suitable apparatus for shrinking the pocketed web about the articles.

A further object of this invention is to provide an apparatus of the foregoing type wherein the pocketed web may either be formed from a roll of web material or by means of a falling curtain of web forming material.

A still further object of this invention is to provide a novel method of forming a pocketed web comprising generally the steps of providing a rotating drum having a peripheral recess in which a plurality of pocket defining webs are formed, and delivering to the peripheral surface of the drum a falling curtain of web forming material which is capable of being solidified as it strikes the drum and being drawn into the recesses in the drum to form pockets in the newly formed web.

Still another object of this invention is to provide a falling curtain of web forming material which is provided at transverse intervals with thickened portions alignable with ends of recesses in a drum for the purpose of supplying extra web forming material as is required to form the ends of pockets within the recesses in the drum.

With the above and other objects in view that will hereinafter appear, the nature of the invention will be more clearly understood by reference to the following detailed description, the appended claims and the several views illustrated in the accompanying drawings:

In the drawings:

FIGURE 1 is a schematic perspective view showing a preferred form of packaging apparatus in accordance with this invention.

FIGURE 2 is an enlarged side elevational view of the left end of the packaging machine of FIGURE 1 with portions thereof broken away and shown in section and clearly shows the manner in which a pocketed web is formed from a falling curtain of web forming material.

FIGURE 3 is a fragmentary transverse horizontal sectional view taken along the line 3—3 of FIGURE 2 and shows specifically the cross section of the falling curtain of web forming material.

FIGURE 4 is a fragmentary transverse sectional view taken along the line 4—4 of FIGURE 2 and shows the specific details of the drum and carrier associated therewith for forming the pocketed web.

FIGURE 5 is an enlarged fragmentary vertical sectional view taken along the line 5—5 of FIGURE 4 and shows the specific manner in which a vacuum is drawn within a recess in the drum.

FIGURE 6 is an enlarged fragmentary top perspective view of the drum of FIGURE 2 and shows generally the details of the carrier associated therewith and the newly formed web.

FIGURE 7 is an enlarged fragmentary transverse vertical sectional view taken along the line 7—7 of FIGURE 1 and shows the specific relationship of the carrier, the pocketed web, a support unit and a filler unit during the filling of a pocket in the web.

FIGURE 8 is a fragmentary perspective view showing a modified carrier and drum construction to be utilized in lieu of the drum and carrier shown in FIGURE 1.

FIGURE 9 is a side elevational view with parts broken away and shown in section of a modified form of packaging apparatus.

FIGURE 10 is a side elevational view similar to FIGURE 9 and showing still another form of packing apparatus.

Referring now to the drawings in detail, it will be seen that there is illustrated in FIGURES 1 through 7 a first form of packaging apparatus in accordance with this invention, the packaging apparatus being generally referred to by the numeral **15**. The packaging apparatus **15** includes three longitudinally spaced shafts **16**, **17** and **18**. The shaft **16** has rotatably mounted thereon a drum which is generally referred to by the numeral **19**. The shaft **17**

has mounted thereon a pair of transversely spaced sprockets 20. The shaft 18 has mounted thereon a pair of transversely spaced sprockets 21 which is longitudinally aligned with the sprockets 20. The apparatus will include suitable drive means (not shown) for driving the drum 19 and the sprockets 20 in unison. The sprockets 21 may be idlers driven from the sprockets 20.

Referring now to FIGURES 2, 4 and 5, it will be seen that the drum 19 includes a hub 23 which is suitably secured to the shaft 16 for rotation therewith. A disk portion 24 extends outwardly from the hub 23 and terminates in a peripheral rim 25. The peripheral rim has secured to the opposite edges thereof suitable side plates 26. The rim 25 is relatively thick, as is shown in FIGURE 2, and has formed in the outer surface thereof a plurality of pocket defining recesses 27. In accordance with the preferred embodiment of the invention, there are two rows of the recesses 27 although the number of rows of recesses may be increased or decreased. Each of the recesses 27 is of a V cross section with each recess 27 having a pair of side walls 28 extending transversely of the drum 19 and a pair of end walls 29 extending circumferentially of the drum 19. The side walls 28 are preferably disposed at an angle on the order of 90°.

In order that web forming material may be drawn down into each of the recesses 27, the bottom of each recess 27 is defined by a filter block 30, the configuration of which is best shown in FIGURE 5. It has been found that the drum 19 may be most easily formed by transversely machining the rim 25 and when there is more than one row of the recesses 27, a single filter block 30 may extend entirely across the rim 25 as is shown in FIGURE 4. In such event, a suitable divider strip 31 will be positioned on the rim 25 between the side plates 26 for separating the rim 25 transversely into the individual recesses 27.

The underside of each filter block 30 is provided with a passage 32 to which there is connected a fitting 33. To each fitting 33 there is secured a line 34 by means of a nut 35. Each line 34, as is shown in FIGURE 4, is connected at its opposite end by means of a fitting 36 to the disk portion 24 of the drum 19 in communication with a passage 37 formed in the disk portion 24.

In order that the recesses 27 may automatically have a vacuum drawn therein and then vented, there is mounted on the shaft 16 in a fixed position a valve plate 38. The valve plate 38 may be suitably anchored to a support 40 for the shaft 16. A suitable sealing disk 41 is positioned between the valve plate 38 and an opposing surface of the disk portion 24 to form a seal therebetween.

The face of the valve plate 38 opposing the disk portion 24 is provided with an arcuate passage 42 the extent of which is best shown in FIGURE 2. A vacuum line 43 is suitably connected to the passage 42 for continously drawing a vacuum therein.

The face of the valve plate 38 opposing the disk portion 24 of the drum 19 is provided with a second arcuate passage 44, the outline of which is best shown in FIGURE 2. The passage 44 is either vented to the atmosphere or connected to a source of air under pressure by means of a passage 45.

It will be readily apparent by comparing FIGURES 2 and 4 that as the drum 19 rotates, the individual recesses 27 formed therein will have a vacuum drawn therein as they pass between a horizontal position at the left of the drum, as viewed in FIGURE 2, until they reach a vertical position. Then the related passages 37 will come into communication with the passage 44 and the recesses will be vented to the atmosphere or slightly pressurized.

An endless carrier 47 is entrained about the drum 19 and is supported remote from the drum in a manner to be later described. The endless carrier 47 is preferably in the form of a thin belt of stainless steel or other corrosion resisting metal although it may be coated with a sealing material such as rubber. The carrier 47 is of a perforated construction and has perforations 48 formed therein for alignment with the recesses 27, as is clearly shown in FIGURE 2. In order that the perforations 48 may be aligned with the recesses 27, the drum 19 has projecting radially outwardly from the side plates 26 thereof a plurality of small pins 49. The pins 49 are received in apertures 50 formed in the border portions of the carrier 47. In this manner the carrier 47 is driven by the drum 19.

A web forming material supply apparatus, which is generally referred to by the numeral 51, is positioned at the left end of the apparatus 15, as is clearly shown in FIGURES 1 and 2. The apparatus 51 includes a tank 52 which is mounted above the center of the drum 19 and generally in vertical tangential relationship thereto. The tank 52 is preferably a sealed and insulated tank and is supported for pivotal movement about a horizontal axis by means of a yoke 53 and trunnions 54.

A collection box 55 is disposed in vertical alignment with the tank 52 below the horizontal center of the drum 19. The purpose of the collection box 55 is to receive web forming material 56 flowing from the tank 52 and not utilized in the forming of the web, and for replenishing the supply of additional material to replace material used in forming the web. A suitable pump 57 is provided for returning the web forming material from the collection box 55 to the tank 52. It is to be understood that the web forming material 56 disposed within the tank 52 will be continuously re-supplied in a manner not shown and will be maintained at a predetermined temperature by means of suitable heaters also not shown. The tank 52 may be internally pressurized by means of the pump 57 and suitable means, not shown, may be provided for removing entrapped air and other gases.

Merely for illustrative purposes, the tank 52 is shown as having a handle 58 for controlling the positions thereof. It will be readily apparent from FIGURE 2 that the tank 52 may be tilted so that the web forming material 56, which flows in the form of a curtain 59, may be directed into the collection box 55 bypassing the drum 19 when it is not desired to operate the remainder of the apparatus 15. When it is desired to form a pocketed web, which web is generally referred to by the numeral 60, the tank 52 is tilted to a position wherein the curtain 59 is directed against the carrier 60. Although the curtain 59 is flowing downwardly and the contacted portion of the carrier 47 is moving upwardly, the bond between the web forming material 56 and the carrier 47 is sufficient for the web forming material 56 to follow the carrier. In view of the fact that a vacuum is drawn into the recesses 27 immediately after the web forming material 56 is applied to the carrier 47, it will be seen that the desired pockets 61 are formed in the web 60. Since the web forming material 56 is substantially in liquid form immediately prior to the contacting thereof with the carrier 47, and has not solidi fied completely, it may be easily drawn into the recesses 27 to assume the contour thereof.

At this time it is pointed out that it is preferable, but not necessary, that the width of the curtain 59 be in excess of the width of the carrier 47. By so forming the curtain of web forming material, there will be an assurance that the resultant web 60 will be of the same width as the carrier 47. The excess of the web forming material 56 forming the curtain 59 will flow past the carrier 47 and down into the collection box 55 in the manner generally shown in FIGURE 1.

It will be readily apparent that when the web forming material is drawn into the recesses 27, there will be a stretching and thinning of the material. While the material forming the sides of each pocket 61 will not be unnecessarily thinned, under normal circumstances there will be a much greater thinning of the web forming material at the ends of each pocket 61. In order to prevent this, as is clearly shown in FIGURE 3, the tank 52 has a discharge orifice 62 which is principally of a constant

width, but is increased in width generally in alignment with the end walls 29 of the recesses. When the web 60 is formed with two rows of pockets 61, the orifice will be provided with three of the enlargements 63 so that the curtain 59 of web forming material 56 will in effect have three ribs 64 formed therein. The extra material of the ribs 64 will be drawn into the recesses 27 and the ends of the pockets 61 will be formed without any undesired thinning of the web.

Referring once again to FIGURE 1 in particular, it will be seen that the apparatus 15 includes a support assembly which is generally referred to by the numeral 65. The sprockets 20 and 21 are parts of the support assembly 65. Entrained over each pair of aligned ones of the sprockets 20 and 21 is an endless chain 66. A plurality of support units, each generally referred to by the numeral 67, extends transversely between the endless chains 66 and are carried thereby. As is best shown in FIGURE 7, each support unit 67 is secured to a chain 66 at the end thereof by means of a suitable bracket 68. Further description of the details of the bracket 68 is not believed to be necessary.

Each of the support units 67 has formed therein a recess or recesses in accordance with the recesses in the drum 19. The recesses in the support units 67 are referred to by the numeral 69 and have exactly the same configuration as the recesses 27. The bottom of each recess 69 is defined by a filter block 70 which is identical with the filter block 30. The underside of the filter block 70 has a flow passage 71 formed therein which is disposed in communication with a passage 72 which opens upwardly through the upper surface of the support unit 67 at at least one end thereof. It may be said that each support unit 67 is provided at its opposite ends with projecting ears 73. It is through the upper surface of one of these ears that the passage 72 extends. A suitable sealing ring 74 is carried by the associated ear of each support unit 67 surrounding the passage 72 to form a seal which will be described in more detail hereinafter.

It is to be understood that the support units 67 will move in unison with the carrier 47 and the web 60 formed thereon so that the pockets 61 will pass down into the recesses 69 automatically. This uniformity of movement is accomplished by the drive means for the apparatus 15 which may be of any conventional type and which is generally described hereinbefore. The carrier is supported by the support units 67 remote from the drum 19.

The support units 67 support the pockets 61 of the web 60 during a filling operation. In order to automatically accomplish the filling of the pockets 61, the apparatus 15 includes a filling apparatus which is generally referred to by the numeral 75. The filling apparatus 75 includes a plurality of fillers 76 which are suitably mounted for movement in an orbital path of which a portion is aligned with the path of movement of the support units 67, the carrier 47 and the web 60. Each filler 76 includes a lower head 77 which is vertically movable and which is provided at the opposite sides thereof with projecting flanges 78. The flanges 78 have pins 79 depending therefrom for reception within apertures 80 formed in the ears 73 of the support units 67 for the purpose of assuring alignment of the support unit 67 with the fillers 76 during a filling operation.

Each of the fillers 76 also includes an upper hopper 81 to which the head 77 is connected by means of an extensible connection 82. The specific details of each filler 76 will not be set forth here. However, it is to be understood that it is preferred that the filler 76 be of the gaseous pressure differential type which are more fully disclosed in my copending application Ser. No. 299,696, filed Aug. 5, 1963, and now Patent No. 3,260,285, granted July 12, 1966. It is to be understood, however, that when the fillers 76 are of the gaseous pressure differential type, a vacuum may be drawn within the pockets 61 of the web 60 during the filling operations, and therefore, it is highly desirable that the pockets 61 be firmly anchored within the recesses 69 of the support unit 67 during the filling operation. It is for this purpose that the filter block 70 and the passages 71 and 72 are provided. Furthermore, each filler head 77 will have a passage 83, as is shown in FIGURE 7, which is alignable with the passage 72 and automatically placed in communication therewith when the filler head 77 is lowered to the position shown in FIGURE. 7. A suitable vacuum will automatically be drawn through the passages 83, 72 and 71 in timed relation to the operation of the associated filler 76.

It is to be understood that when the fillers 76 are of the gaseous pressure differential type, and the product being placed in the pockets 61 is of the flowable solid type, the fillers 76 will function to remove substantially all entrapped air and gases therefrom so that a uniform compaction of the product within the pocket 61 may be obtained. Thus, the filler 76 may serve to fill each pocket 61 with a predetermined weight of the product. It is to be understood, however, that suitable weighing apparatus may be incorporated in the filler 76 if it is so desired.

After the pockets 61 in the web 60 have been filled utilizing the fillers 76, a cover web 85 will automatically be applied to close the individual pockets 61. The cover web 85 may be dispensed from a suitable roll (not shown) and is applied to the web 60 by means of a roller 86. The connection between the webs 60 and 85 may be of the pressure sensitive type, heat sealed type, etc.

Although the sealed together webs 60 and 85 have been illustrated as passing from the apparatus 15 in the form of a continuous web, it is to be understood that conventional severing means may be provided for dividing the packaged units into individual packages. If desired, however, groups of four packages may be severed and due to the particular cross section of the pockets 61, the four packages may be relatively folded to form a square. In this manner the four packages may occupy a minimum of space for further packaging.

Referring now to FIGURE 8 in particular, it will be seen that there is illustrated a modified form of apparatus to be utilized in forming the pocketed web 60 and delivering the same to the filling apparatus 75. In lieu of the endless carrier 47, it is proposed to provide a carrier 90. The carrier 90 may be formed of cardboard or other relatively inexpensive material which is suitable for forming a base of a package. The carrier 90 is supplied in the form of a roll 91 which may be supported on a suitable shaft 92. The carrier 90 is perforated in the same manner as is the carrier 47 so as to have perforations 92 which are alignable with the recesses 27 in the associated drum, which drum is generally referred to by the numeral 93. The borders of the carrier 90 are provided with narrow longitudinally extending openings 94 for the purpose of facilitating the alignment of the perforations 92 with the recesses 27.

It is to be understood that the drum 93 will be identical to the drum 19 with the exception that in lieu of being provided with the pins 49 of the drum 19, the edge portions of the drum 93 will be provided with narrow circumferentially extending slots 95.

The feeding of the carrier 90 onto the drum 93 with the perforations 92 in alignment with the recesses 27 is accomplished by means of a pair of star wheels 96. The star wheels 96 are carried by a transverse shaft 97 and the points thereof are simultaneously passable through the openings 94 in the carrier or web 90 and into the notches 95 in the drum 93.

It is to be understood that when the curtain 59 of web forming material strikes the carrier 90, it will become bonded thereto. The pocket 61 formed in the web 60 will pass through the perforations 92 in the carrier 90 and the web 60, reinforced by the carrier 90 will be filled in the manner described above. After the cover web 85 has been applied, the webs 85 and 60 and the carrier 90

will be simultaneously cut into idividual packages or groups of packages.

Referring now to FIGURE 9 in particular, it will be seen that there is illustrated another form of packaging apparatus which is generally referred to by the numeral **100**. The packaging apparatus **100** includes a drum which is generally referred to by the numeral **101**. The drum **101** is of a construction very similar to the drum **19** and differs therefrom primarily in the shape of recesses **102** formed therein. It is to be noted that the recesses **102** are generally semi-circular in cross section. Also, it is to be noted that there is associated with the drum **101** a valve plate **103** which corresponds to the valve plate **38** but which is positioned on the order of 75° in a counterclockwise direction from the valve plate **38**.

The drum **101** has associated therewith the apparatus **51** for supplying web forming material in the form of a curtain **59**. As the drum **101** rotates in a counterclockwise direction, the curtain **59** may be directed onto the peripheral surface thereof to form a continuous web which is generally identified by the numeral **104**. The web is drawn into the recesses **102** to form pockets **105**. The pockets **105** will be formed in one or more rows longitudinally of the web **104**.

An endless conveyor belt **106** underlies the drum **101** and is supported by a pair of longitudinally spaced rolls **107** disposed on opposite sides of the center of the drum **101**. The conveyor belt **106** is of sufficient length so as to bow downwardly between the rolls **107** generally in engagement with the peripheral surface of the drum **101**.

A suitable web **108** is fed between the drum **101** and the conveyor belt **106**. There is positioned on the web **108** articles **109** to be packaged. The articles **109** are spaced in accordance with the spacing of the pockets **105** and when there is more than one row of pockets **105**, there will be a like number of rows of articles **109**.

It will be readily apparent from FIGURE 9 that as the drum **101** rotates and the web **104** is formed thereon, the web **108** carrying the articles to be packaged are fed beneath the drum **101** and the articles **109** are received in the pockets **105**. The web **104** is bonded to the web **108** either by means of an adhesive or by means of a heat sealable connection.

As the webs **104** and **108** pass out from under the drum **101**, the articles **109** are sealed between the two webs. However, the pocket **105** will be relatively loose with respect to the article. The webs **104** and **108** will then pass under a hood **110** in which there is positioned a suitable heating element **111**. When the web **104** is formed of a heat shrinkable plastic material, the pocket **105** will be shrunk about the article **109**, as is shown at the right of FIGURE 9.

It is to be understood that individual packages may be formed from the continuous packet strip by severing the webs **104** and **108** between the articles **109** in any desired manner.

Referring now to FIGURE 10, it will be seen that there is illustrated another form of package forming apparatus which is generally referred to by the numeral **120** and which corresponds generally to the package forming apparatus **100** of FIGURE 9. The apparatus **120** includes a drum **121** which may be identical with the drum **101**. However, the drum **121** has associated therewith a valve plate **122** which has a different passage arrangement from those of the valve plates **38** and **103** for a reason to be described in more detail hereinafter.

In lieu of forming a continuous web from a curtain of flowing web forming material, in accordance with the apparatus **120**, it is proposed to provide the web in roll form. The illustrated web is identified by the numeral **123** and the roll of web **123** is identified by the numeral **124**. The roll **124** is carried by a suitable support **125** and the web **123** passes under a roller **126** onto the peripheral surface of the drum **121** which is rotating in a counterclockwise direction.

The web **123** is preferably formed of a heat shrinkable plastic material and is readily softened by the application of heat. To this end, a heater manifold **127** overlies a large portion of the drum **121** for the purpose of heating the web **123** as it passes around the drum. Once the web **123** has been heated, the vacuum drawn in the recesses **102** in the peripheral surface of the drum **121** will result in the formation of pockets **128** in the web **123**. The vacuum is drawn in the drum **121** through an elongated passage **129** formed in the valve plate **122**. A shorter vent passage **130** is also formed in the valve plate **122** to relieve the vacuum in the recesses **102**.

After the pockets **128** have been formed in the web **123**, the web **123** is united with the web **108** in overlying relation to the articles **109** in the same manner as described above with respect to the web **104**. The web **123** is then heated to shrink the pockets **128** thereof around the articles **109**.

Although several preferred embodiments of the invention have been specifically illustrated and described herein, it is to be understood that other modifications may be made in the packaging apparatus without departing from the spirit and scope of the invention, as defined in the appended claims.

I claim:

1. An apparatus for forming a pocketed web on a continuous basis in forming of sealed packages, said apparatus comprising a rotating drum having a peripheral surface with a plurality of circumferentially spaced pocket defining recesses formed therein, means for delivering a flowing curtain of web forming material to the periphery of said drum, and means connected to said drum for sequentially drawing a vacuum in each recess to draw said flowing web against said drum peripheral surface and into said recesses and forming pockets in the web and then venting the recesses to release the newly formed pocketed web.

2. The apparatus of claim **1** wherein the means for delivering a flowing curtain of said web forming material to said drum includes a tank of liquid web forming material having a bottom orifice for discharging said liquid web forming material in the form of a screen, and means mounting said tank for tilting movement about a generally horizontal axis to vary the vertical alignment relationship between said orifice and said drum to control the application of the flowing screen to said drum.

3. The apparatus of claim **1** wherein said recesses have ends extending circumferentially of said drum for defining ends of pockets, the menas for delivering a flowing curtain of web forming material to said drum includes a tank of liquid web forming material having a bottom orifice for discharging said liquid web forming material in the form of a screen, said orifice having portions of increased width generally in alignment with said recess ends to provide extra web forming material as required for the forming of pocket ends.

4. The apparatus of claim **1** wherein said recesses have ends extending circumferentially of said drum for defining ends of pockets, the means for delivering a flowing curtain of web forming material to said drum includes a tank of liquid web forming material having a bottom orifice for discharging said liquid web forming material in the form of a screen, said orifice having portions of increased width generally in alignment with said recess ends to provide extra web forming material as required for the forming of pocket ends, and means mounting said tank for tilting movement about a generally horizontal axis to vary the vertical alignment relationship between said orifice and said drum to control the application of the flowing screen to said drum.

5. The apparatus of claim **1** wherein said recesses have ends extending circumferentially of said drum for defining ends of pockets, and said means for delivering a curtain of web forming material includes means for thickening said web in alignment with said recess ends to pro-

vide extra web forming material as required for the forming of pocket ends.

6. The apparatus of claim 1 wherein the direction of movement of said drum peripheral surface adjacent said web is opposite to that of the flowing web.

7. The apparatus of claim 1 wherein the direction of movement of said drum peripheral surface adjacent said web is the same as that of the flowing web.

8. The apparatus of claim 1 wherein a perforated carrier is passed around said drum for receiving said flowing web, and means aligning said perforated carrier with said drum recesses.

9. The apparatus of claim 1 wherein a perforated endless reuseable carrier is passed around said drum for receiving said flowing web, and means aligning said perforated carrier with said drum recesses.

10. The apparatus of claim 1 wherein a perforated disposable web adhering carrier is passed around said drum for receiving said flowing web, and means aligning said perforated carrier with said drum recesses.

11. The apparatus of claim 1 wherein the bottom of each recess is formed by a filter block.

12. An apparatus for forming sealed packages comprising a rotating drum having a peripheral surface with a plurality of pocket defining recesses formed therein, a perforated carrier passing around said drum in registration with said recesses, means for delivering a flowing curtain of web forming material to the periphery of said drum, means connected to said drum for sequentially drawing a vacuum in each recess to draw said flowing web against said drum peripheral surface and into said recesses and forming pockets in the web and then venting the recesses to release the newly formed pocketed web, a plurality of support units for supporting said carrier and web during a filling operation, a plurality of fillers mounted for movement in an orbital path with a portion of said path overlying said support units; and means for interlocking said filler units, said carrier and web and said support units during filling operations.

13. The apparatus of claim 12 wherein said fillers are of the gaseous pressure differential type, and said support unit having web pocket shape retaining means of the vacuum type operated by said fillers.

14. An apparatus for forming sealed packages comprising a rotating drum having a peripheral surface with a plurality of pocket defining recesses formed therein, web material supplying means for delivering a flowing curtain of web forming material to the periphery of said drum, means connected to said drum for sequentially drawing a vacuum in each recess to draw said flowing web against said drum peripheral surface and into said recesses and forming pockets in the web and then venting the recesses to release the newly formed pocketed web, means for supplying a readily deformable web material to said drum for the formation of pockets therein, and means for delivering an article bearing web to said drum for receiving said pocketed web with pockets in said pocketed web receiving the articles.

15. The apparatus of claim 14 together with means for heat shrinking the pockets around the articles.

16. The apparatus of claim 14 wherein said web material supplying means includes a support for a roll of web material and a heater for softening the web material as it passes around said durm.

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