Aug. 25, 1970 D. B. CUTLER ET AL 3,525,193

BRUSH PRODUCT STRIPPER

Filed Feb. 23, 1968 3 Sheets-Sheet 1

FIG. 1

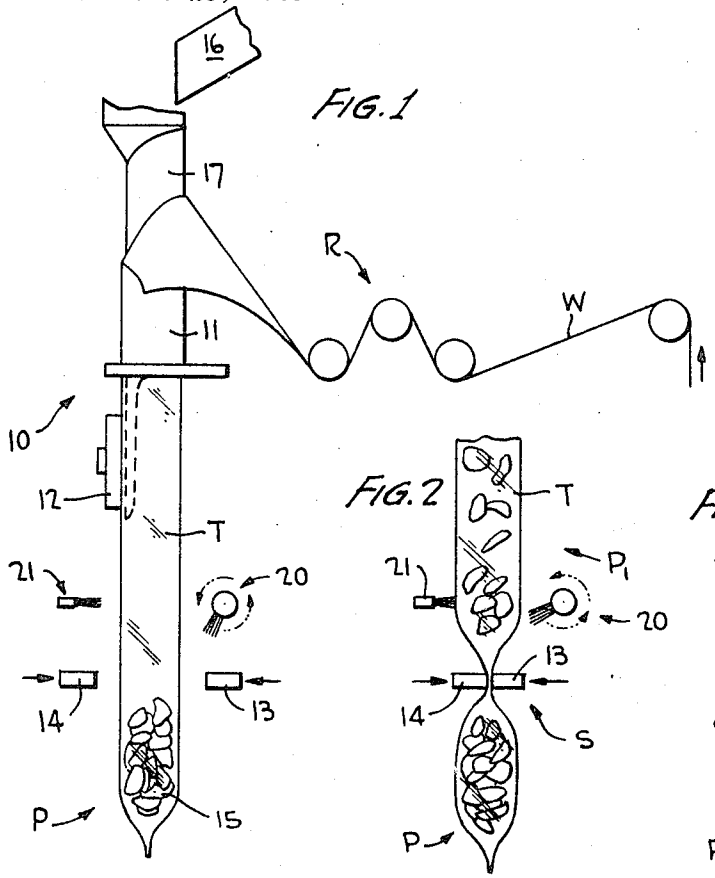


FIG. 2

FIG. 3

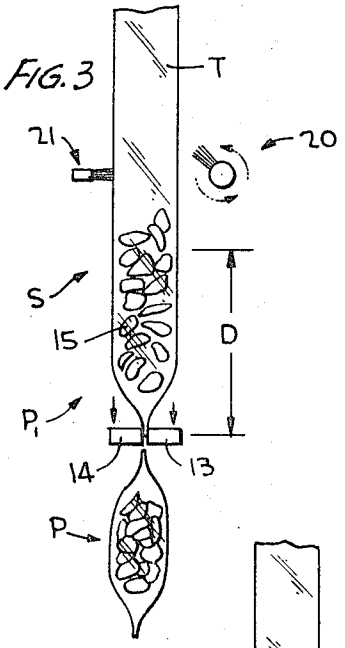


FIG. 4

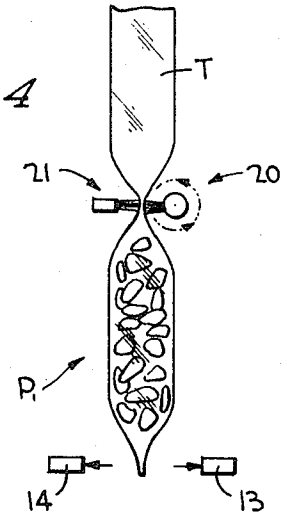


FIG. 5

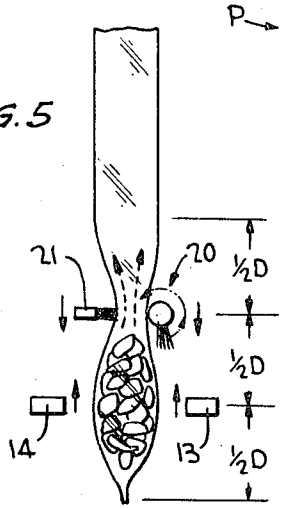
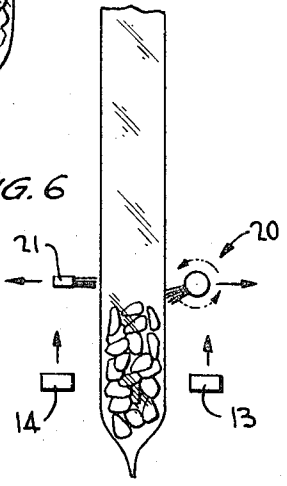


FIG. 6



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BRUSH PRODUCT STRIPPER

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FIG. 7

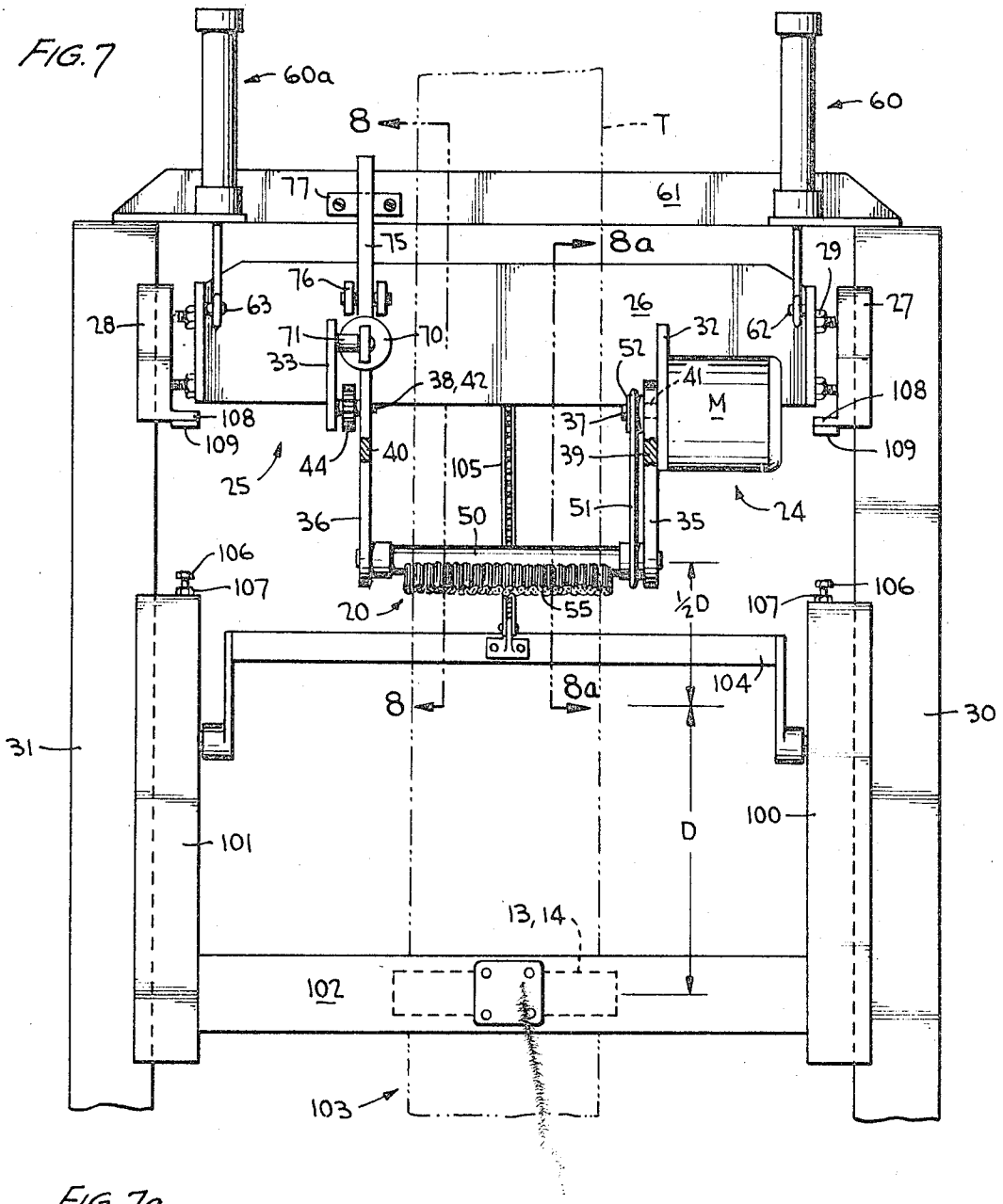
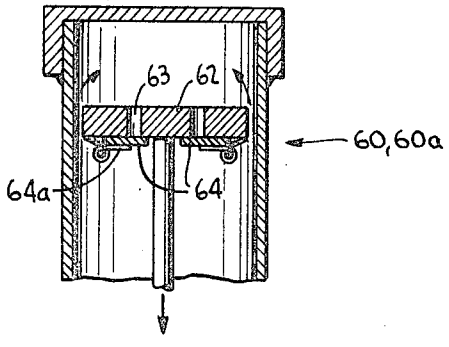


FIG. 7a



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FIG. 8

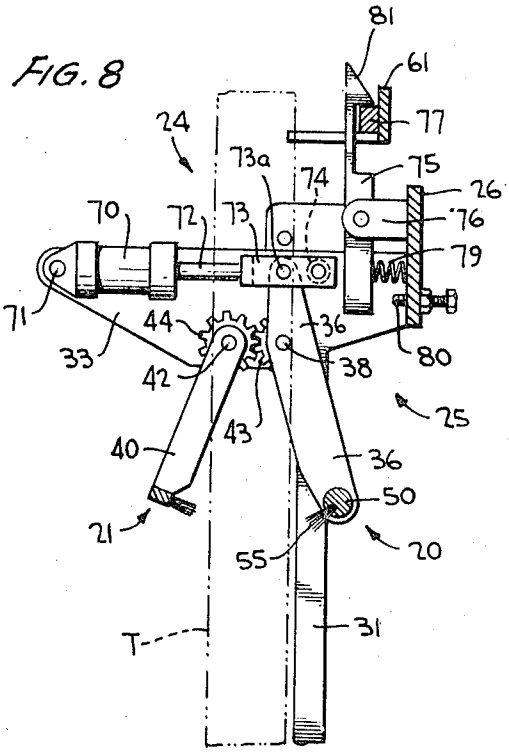


FIG. 8a

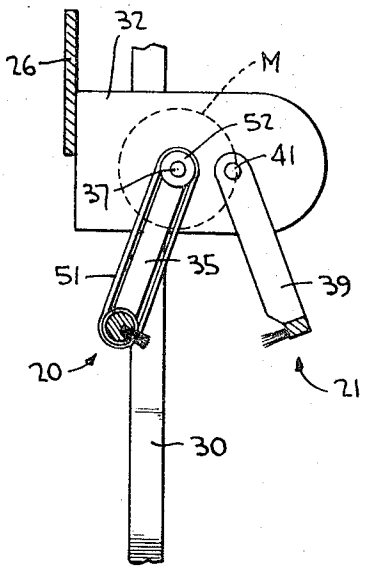
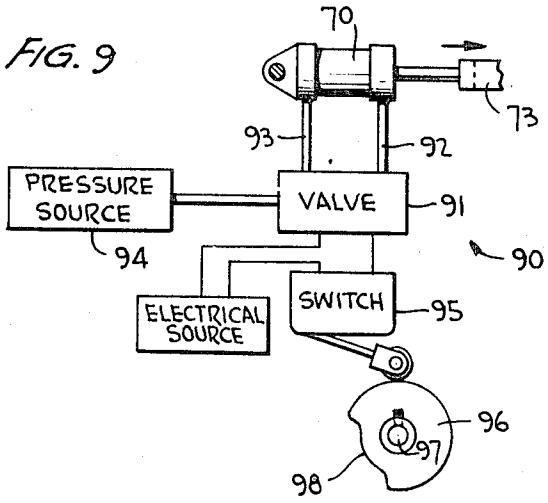


FIG. 9



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3,525,193

BRUSH PRODUCT STRIPPER

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Filed Feb. 23, 1968, Ser. No. 707,607
Int. Cl. B65b 9/10
U.S. Cl. 53—28 21 Claims

ABSTRACT OF THE DISCLOSURE

Method and apparatus of the form and fill type wherein the product is stripped from the tranverse seal area of the tube and yieldably forced into the bottom of the package by a pair of brushes that resiliently flatten and are moved relative to the formed tube by a reciprocating carriage. The stripping operation and the return of the brushes to the normal position is carried out simultaneously with the return movement of the sealing jaws for minimum cycle time. One brush is rotated to more effectively urge the product into the package and is effectively moved back and forth against the tube so as to vibrate the same and cause a complementary settling of the product and release of air from said package.

The present invention relates to the field of packaging of the form and fill type and, more particularly, to an improved method and apparatus for this type of packaging wherein the product is more efficiently positioned in the package being formed.

As is well known in the art of packaging, the form and fill process employs a continuous web of sheet material which is shaped into a tube by passing the same over a former device. The product being packaged is inserted into the tube through its open end in predetermined charges, and transverse heat seals are formed across the tube to separate the charges and form successive packages, which are then severed from the tube. This type of machine is adapted for packaging a wide range of products but has found particular acceptance in the packaging of food products, especilly high volume, low weight products, such as potato chips.

In prior art arrangements specifically adapted for products such as potato chips, which, because of their uneven shape and lightness are not easily settled in the bag, it has been found necessary prior to forming of the transverse heat seal to strip the product from the seal area of the tube. This is so since if a potato chip is caught between the sides of the tube during the sealing process, the opposed inside faces of the tube are not fused together and an imperfect heat seal results. Universally, these prior stripping devices have employed a pair of metal plates positioned on opposite sides of the tube, which are brought together to flatten the tube whereupon the plates and the tube are moved relative to each other in the longitudinal direction towards the bag being formed to free the seal area of product. These devices have been subject to certain shortcomings which have led to inefficiency of the form and fill packaging process. First, with the use of the metal plates or their equivalent, the straight stripping or squeezing action on the tube in many cases is so severe that there is a tendency to burst the bag being

formed along the bottom transverse seal, especially where the bag might have a slightly overweight charge or where an unusually high "mound" of product is formed in the middle of the bag. This shortcoming has led to the use of such stopgap measures as holding the sealing jaws in engagement with the bottom seal while the stripping operation takes place, as disclosed by the patent to Gausman, 2,956,383, issued Oct. 18, 1960. This, however, greatly increases the cycle time of the machine since the sealing jaws cannot be started on the return stroke until the stripping operation has been completed.

In another prior art arrangement, stripping is accomplished by mounting said stripping plates on the sealing jaws, as disclosed by the patent to Leasure, 3,027,695, issued Apr. 3, 1962. In operation, while the plates are disengaged from the tube one or the other is moved through a distance more than one package length which is followed by a limited return stripping stroke in the opposite direction. Thus, in this case the time required for carrying out a packaging cycle is also increased since during each cycle the total movement of the sealing jaws must be for a distance more than would otherwise be required to provide for a stripping portion of the cycle. Another universal disadvantage of the use of the prior art stripping arrangements just described when packaging frangible products, such as potato chips, lies in the fact that the unyielding force of the metal plates tends to crush the product, thereby causing a source of dissatisfaction for the customer.

Accordingly, it is one object of the present invention to overcome the shortcomings of the prior art described above through the use of a novel method and apparatus which is adapted for a minimum packaging cycle time, thereby increasing the overall efficiency of the operation.

It is another object of the present invention to provide a method and apparatus which employs opposed brushes to resiliently flatten the tube and thereby yieldably act on the product during the stripping operation to prevent crushing of the product.

It is still another object of the present invention to provide an improved method and apparatus for packaging wherein is utilized a combination of stripping and vibration settling action to further reduce the cycle time and minimize breakage or crushing of the product.

To briefly describe the arrangement disclosed for illustrating the principles of the present invention, successive individual packages are formed in a continuous tube by a pair of transverse sealing jaws, and each of the packages is filled with product in turn. The sealing jaws are moved downwardly from the sealing station while still engaged with the tube to draw a new length for forming each successive package. When the sealing jaws reach the lowermost point of their travel during each cycle, the stripping operation is initiated. In accordance with the present invention, this is accomplished by applying a pair of brushes on opposite sides of the tube to resiliently flatten the same immediately above the new length of tube and then relatively moving the brushes with respect to the tube to move across the area of the tube which is to receive the seal. Of importance to an efficient operation is that the brushing action not only strips the product from the seal area but also yieldably forces the same into the bottom of the package being formed. Because of the

fact that the stripping operation is carried out with the use of brushes which are resilient and subject to give to a selected degree, the severity of the prior art operations, which utilized metal plates with resultant bursting of the bottom seal and crushing of the product, is avoided.

In accordance with another feature of the present invention, at least one of the brushes is rotated about its longitudinal axis which extends transversely across the tube so that the brustles of the brush more effectively urge the product into the final position within the package. Also, the rotating brush preferably has bristles through only a limited arc so that upon rotation, the brush is moved back and forth against the tube to vibrate the package being formed and induce settling of the product simultaneously with the stripping function. Furthermore, with the intermittent release of pressure on the tube by the rotating brush, air is allowed to escape from the package being formed to thereby negate another possible source of bursting of said package and allow the formation of flatter packages, which is desirable.

Advantageously, the sealing jaws need move only through a distance of one package length and the stripping operation is performed concurrently with the return stroke of the sealing jaws so that minimum cycle time is attained. Furthermore, the brushes are conveniently moved on the stripping and settling stroke by gravity and on the return stroke as a follower to the sealing jaws so that no additional power means is required for the stripping operation. Furthermore, to gain maximum stripping in the minimum amount of cycle time, the work stroke of the brushes is commenced only after the sealing jaws and the drawn tube reach their lowermost position and the stroke is terminated at substantially the mid-point of the return stroke of the sealing jaws; the return stroke of the brushes occurring concurrently with the last half of the return movement of the sealing jaws.

In accordance with additional features of the apparatus, the brushes are mounted on a movable carriage to form a stripper assembly, which falls by gravity when released on signal, causing the brushes to move along the tube for the stripping operation; this feature thus insuring that the brushes have maximum stability as a result of the accompanying mass of the carriage for a more uniform stripping and setting action. Further, this carriage is supported along the existing guideways provided for the carriage that supports the sealing jaws so that little or no modification of existing packaging machines is required to convert the same to use the new stripper assembly. The initiation of the movement of the stripper assembly on the downward stroke is controlled in a novel manner by a latch means which is timed to coincide with the limit of the downward movement of the sealing jaw carriage. Furthermore, this downward movement is regulated by dashpot cylinders connected to the carriage so as to give a controlled movement to the brushes for obtaining maximum stripping efficiency. Also, the brushes are mounted for movement toward and away from the tube on pivotal levers which are interconnected with the actuator for the latch means whereby flattening of the tube by the brushes is insured prior to release of the carriage.

Still other objects and advantages of the present invention will become readily apparent to those skilled in this art from the following detailed description, wherein we have shown and described only the preferred embodiment of the invention, simply by way of illustration of the best mode contemplated by us of carrying out our invention. As will be realized, the invention is capable of other and different embodiments, and its several details are capable of modification in various obvious respects, all without departing from the invention. Accordingly, the drawings and description are to be regarded as illustrative in nature, and not as restrictive.

In the drawings:

FIG. 1 is a diagrammatic showing of a form and fill arrangement designed to utilize the principles of the present invention;

FIGS. 2–6 are diagrammatic showings of the sequence of operation following the showing of FIG. 1, which operation is in accordance with the principles of the method of the present invention;

FIG. 7 is a front view of an apparatus, with certain parts broken away for clarity, for carrying out the principles of the present invention;

FIG. 7*a* is a detail cross-sectional view of one component part of the apparatus of FIG. 7;

FIG. 8 is a cross-sectional view of the apparatus taken along line **8—8** of FIG. 7;

FIG. 8*a* is a cross-sectional view taken along line 8*a*—8*a* of FIG. 7 looking in the direction opposite to that of FIG. 8; and

FIG. 9 is a schematic diagram of a control system suitable for use with the apparatus of the present invention.

Proceeding now to more specifically describe the preferred embodiment of the method and apparatus of the present invention, there is shown in FIG. 1 of the drawings a form and fill packaging arrangement **10** which receives a web W of sheet material, such as glassine, cellophane or polyethylene, and forms a continuous tube T from which successive packages are to be formed. As illustrated, the web W is trained over a plurality of guide rollers R and then passed up and over a conventional winged former **11.** As is known in the art, the winged former **11** reversely directs the web W downwardly thereby forming the continuous tube T with the longitudinal seam being continuously formed by a heat sealing die **12.** A pair of sealing jaws **13, 14** are provided on opposite sides of the tube T to form successive transverse heat seals to complete the package.

Product **15** being packaged enters the open end of the tube T, and in the present instance is repersented by potato chips for ease of description, it being understood that other products could be packaged in accordance with the principles of the present invention. The step of the packaging operation shown in FIG. 1 is where a package P being formed has been filled with a charge of the product **15** by use of a conventional weighing hopper **16** and a cooperating filling tube **17,** and said product **15** has been stripped and positioned in said package P by the improved method and apparatus of the present invention. Specifically, in the step as shown in FIG. 1, the product **15** is positioned well within the limits of the package P and free of the seal area in readiness for the activation of the sealing jaws **13, 14** whereby a perfect heat seal is capable of being formed. Thus, as shown in FIG. 2, the sealing jaws **13, 14** are moved inwardly at a sealing station S to form the seal that completes the package P and initiates the formation of the next in-line package P_1. As soon as the sealing jaws are closed at the sealing station S, the filling portion of the cycle can immediately be initiated to commence filling the package P_1.

At this point, the sealing jaws **13, 14** begin their downward movement while still engaged with the tube T to draw a new length of said tube T equal to the size of the packages being formed, as represented by dimension D in FIG. 3. As will be noted in this figure, the package P previously formed is severed from the tube T at the bottom of the drawing stroke and the next package P_1 is now in posiiton where its top seal can be completed at the sealing station S during the next cycle. However, as can be seen in this figure, the product **15** is free-falling through the tube T (see FIG. 2) has occupied a space which is greater than the length D and thus must be stripped from the proposed seal area of the tube T and positioned within the limits of the package P_1 now being formed so that a good seal will result upon reapplication of the sealing jaws **13, 14.**

In accordance with the present invention, this function is performed by a pair of brushes **20, 21** on opposite sides of the tube T. As will be seen from the following description, these brushes **20, 21** are effective to resiliently flatten the tube T in the manner desired and to yieldably force the product from the area of said tube T adjacent the sealing station S down into its final position within the package P_1. Thus, the normal or upper position of the brushes **20, 21** is as shown in FIG. 3, that is, above the length D of the tube T which has been provided by the downward drawing movement of the sealing jaws **13, 14**. As shown, the brushes **20, 21** are above the top of the product **15** in this upper position by an amount sufficient to insure that the product **15** is included in the package P_1.

At the moment that the sealing jaws **13, 14** reach the limit of their downward movement, they are withdrawn outwardly (see FIG. 4) in order to begin their upward return stroke. Simultaneously therewith, the brushes **20, 21** are brought together on opposite sides of the tube to flatten the same. Upon flattening of the tube T, the stripping operation is readily to begin by downward movement of the brushes **20, 21**; it being understood that the flattening operation brings the sides of the tube T together so that they come into embracing engagement with the upper limit of the product **15**. The brushes **20, 21** are now released for downward movement along the tube T to the position of FIG. 5, thereby stripping the product **15** from the area above the distance D (FIGS. 3 and 5) and urging the same into its final position within the package P_1.

As can be realized from viewing FIG. 5, the stripping operation is timed so as to be performed concurrently with approximately the first half of the return motion of the sealing jaws **13, 14**. Thus, at the completion of the stripping operation, the brushes **20, 21** have moved a distance equal to substantially one-half D in a downward direction and the sealing jaws **13, 14** have moved in the opposite direction substantially an equal distance. It has been found by experience that the distance for movement of the brushes **20, 21** of substantially one-half the package length is sufficient to clear the area of the tube T at the sealing station S is normal operation of the packaging machine for most bag lengths. When the longest bags, such as 18 inch bags, are being formed on the machine, it is possible and desirable to maintain the stripping distance somewhat less than one-half D. In any case, it is emphasized that the stripping operation over this substantial distance is performed without any delay of the packaging cycle since it is performed simultaneously with the return stroke of the sealing jaws **13, 14** which is necessary in any instance.

As illustrated in FIG. 6, after the product **15** has reached its final position within the package P_1, the brushes **20, 21** are withdrawn from the sides of the tube T, in readiness for their return movement to the upper positon, all as indicated by the arrows in this figure. Advantageously, this return movement of the brushes **20, 21** is simultaneous with the last half of the reutrn stroke of the sealing jaws **13, 14** so that the time required to complete the packaging cycle is a minimum. During the last half of the return stroke, the sealing jaws **13, 14** and the brushes **20, 21** move at the same speed so that they reach the home position at the same instant whereupon the cycle just described is ready to be repeated.

In FIGS. 7 and 8 there is disclosed a preferred embodiment of a stripper assembly, generally designated by the reference numeral **24**, for performing the above sequence of operations in accordance with the present invention. Thus, the stripper assembly **24** comprises a carriage **25** including a cross member **26** and supporting slides **27, 28** with any number of bolts **29** interconnecting the same. The slides **27, 28** are adapted for movement along a pair of cooperating guideways **30, 31** which are affixed to the frame of the packaging machine in the usual manner. Extending forwardly from the cross member **26** are a pair of support plates **32, 33** which are utilized to support the brushes **20, 21** in a manner now to be described.

As best shown in FIG. 7, the rotating brush **20** is supported by a pair of pivotal arms **35, 36** on aligned pivot shafts **37, 38** extending through said support plates **32, 33**, respectively. Similarly, the stationary brush **21** is supported by spaced support arms **39, 40** (see FIGS. 8 and 8*a*; omitted from FIG. 7 for clarity) on stub shafts **41, 42**, respectively; said shafts **41, 42** lying in the same horizontal plane as the stub shafts **37, 38**, as can be seen in FIGS. 8 and 8*a*. Fixed for rotation with the stub shafts **38, 42** on the left-hand side (FIG. 7) are a pair of gear segments **43, 44** that lock the arms **36, 40** together for simultaneous pivotal movement to allow the brushes **20, 21** to be brought toward and away from the tube T in unison.

The brush **20** rotates about its axis which is transverse to the tube T being formed so as to positively but resiliently urge the product **15** within the tube T downwardly and into the package P_1 being formed, as pointed out above with respect to FIGS. 4 and 5. Structurally, the brush **20** comprises a core **50** which is rotatably driven by a flexible drive belt **51** from a pulley **52**. The pivot shaft **37** is formed by the drive shaft of a motor M, which operates continuously so as to impart the described action to the tube T when the brushes **20, 21** are brought together.

As viewed in FIGS. 7 and 8, the brush **20** preferably includes a single row of bristles **55** extending longitudinally along the core **50**. This is of importance since such an interrupted operating surface allows the bristles **55** to move into and out of engagement with the tube T with a resilient slapping action to vibrate the same thereby encouraging the product **15** to settle into the bottom of the package P_1 (compare FIGS. 4 and 5). Upon each periodic expansion of the tube T at the top of the package P_1, that is, when the row of bristles **55** is removed from flattening engagement with said tube T (see FIG. 5), air trapped within the package P_1 as a result of the downward stripping action can escape upwardly, as denoted by the flow arrows in FIGURE 5, thereby preventing an increase in pressure which might tend to rupture said package P_1.

There is provided a pair of fluid dashpot cylinders **60, 60***a* which are fixedly mounted on a horizontal frame members **61** of the machine; the piston rods of said cylinders **60, 60***a* being attached to opposite sides of the cross member **26** of the carriage **25** by suitable pins **62, 63**. The function of these cylinders **60, 60***a* is to provide a relatively slow, controlled movement of the stripper assembly **24** during its downward stripping stroke by gravity. Preferably, the cylinders **60, 60***a* are of the one-way type so that the selected resistance is applied during the downward stroke but is substantially released when the brushes **20, 21** are being returned in the upward direction to the normal position in readiness for the next packaging cycle. For example, as shown in FIG. 7*a*, the cylinders **60, 60***a* may be constructed with a piston **62** which is spaced from the side walls of the cylinders **60**, same during the downward movement of the carriage **25**, **60***a* so as to allow a limited flow of fluid around the as shown by the flow arrows; a plurality of passageways **63** being provided in said piston **62**, each with a one-way flapper valve **64** and biasing spring **64***a* so that upon each return stroke an increased amount of fluid can pass from the top of the piston **62** to the bottom. It is contemplated that the action of the cylinders **60, 60***a* is selected to suit the particular packaging operation being performed such as by selecting the proper size piston **62** to control the flow of fluid around the same during the downward stroke.

As best shown in FIG. 8, the means for operating the arms **36, 40** to bring the brushes **20, 21** into flattening

engagement with the tube T, as previously described, includes an actuator cylinder **70** which is pivotally supported on the support plate **33** by a pin **71**. Piston rod **72** of the cylinder **70** is connected to an operating yoke **73** that is pivotally connected to the free end of the upstanding extension **36'** of the arm **36** by a pivot shaft **73***a*. At the read end of the yoke **73** is provided an operating roller **74**, which, as will now be seen, serves to initiate the downward movement of the carriage **25** just after the brushes **20, 21** have been brought together to flatten the tube T, as desired.

Accordingly, a pivotal latch member **75** is mounted on the cross member **26** by support ears **76** and is adapted to hook over the block **77** fixed on the stationary frame member **61**, as can best be seen in FIGS. 7 and 8. A spring **79** is provided opposite the lower end of the latch member **75** to resiliently bias the same in the clockwise direction as viewed in FIG. 8 so as to cause said latch member **75** to remain engaged with the block **77** under normal conditions. When the actuator cylinder **70** is activated, the roller **74** will engage the lower end of the latch member **75** so as to rotate the same counterclockwise about is pivot thereby releasing the carriage **25** and allowing the same to fall downwardly along the tube for the stripping operation. Adjustable stop screw **80** in the cross member **26** limits the movement of the actuator cylinder **70** and thereby is effective to limit the inward movement of the brushes **20, 21** through the supporting arms **35, 36** and **39, 40**. Normally, a spacing substantially equal to the double thickness of the web W is maintained to prevent undue bending of the bristles of the brushes **20, 21** and excessive resistance between said bristles and said web W during the stripping movement. Upon the upward return movement of the carriage **25**, the upper cam face **81** of the latch member **75** (FIG. 8) is operative to engage the lower edge of the block **77** and rotate said latch member **75** in the counterclockwise direction against the action of the spring **79** so as to become relatched and secured in readiness for the next stripping operation.

A control circuit **90**, shown in FIG. 9, is operative to control the activation of the actuator cylinder **70** for the purposes just described. This circuit includes a fluid valve **91** which is connected to opposite ends of the actuator cylinder **70** via lines **92, 93**; the valve **91** receiving pressure fluid from pressure source **94** and serving to feed the same alternately to the lines **92, 93**. The valve **91** is, in turn, controlled by a limit switch **95** which is actuated by a cam **96** which is mounted for rotation on a driven shaft **97** of the main drive system of the packaging machine. The cam **96** has a low quadrant **98** that is positioned so as to operate limit switch **95** for control of the valve **91** to activate the cylinder **70** in timed relationship with the movement of the sealing jaws **13, 14**, that is, during the first one-half of the return stroke, as previously described in the discussion of FIG. 5.

The sealing jaws **13, 14** with operating pneumatic cylinders are preferably supported by structure including a pair of elongated slides **100, 101** and interconnecting member **102** which, taken together, may be considered to form a main carriage of the packaging machine, as generally designated by the reference numeral **103**. As will be realized, this construction allows the required reciprocating movement of said jaws **13, 14** along the guideways **30, 31**, such reciprocating movement being powered through a pivotal yoke **104** and attached drive chain **105** which is in turn connected to the main drive of the packaging machine, all in a conventional manner. In accordance with the present invention, at the top of the slides **100, 101** of the main carriage **103** are provided adjustable jackscrews **106** cooperating lock nuts **107** which are adapted to cooperate with inwardly extending feet **108** at the bottom of the guides **27, 28** of the first mentioned carriage **25**. A resilient pad **109** is attached to the lower face of the feet **108** to absorb the shock of the main carriage **103** moving upwardly into engagement with the slides **27, 28** of the carriage **25**. With this arrangement, it can be seen that the carriage **25** is adapted to be a follower to the main carriage **103** for the upward return stroke, and since, as will be remembered, the downward stripping stroke is by gravity, no additional power source for performing the stripping operation of the brushes **20, 21** is necessary.

From the foregoing description, it can now be seen that the inventive method and apparatus has certain distinct advantages over the prior art arrangements. Namely, with the use of brushes **20, 21** rather than metal plates to engage the sides of the tube T, the product P is more efficiently positioned in its final position within the packages and bursting the bottom seal of the bags as well as breakage of the product **15**, which have been problems in the past, are appreciably reduced. Further, the cycle time for the forming of each package P is reduced to a minimum since the stripping operation is performed during simultaneous movement of the sealing jaws **13, 14** on the first half of their return strokes. Also, of significance is the fact that the stripping operation is performed by the controlled movement of the complete stripper assembly **24** including the carriage **25**. This novel arrangement allows a stripping movement of the brushes **20, 21** downwardly along the tube T without the characteristic jerking movement usually associated with complicated pivoting linkages systems previously utilized for this purpose. Also, the relatively large mass of the carriage **25** is more effective in overcoming any variation in frictional resistance, particularly between said brushes **20, 21** and the tube T, that occur from cycle to cycle.

Since the return of the carriage **25** to its normal raised position in readiness for the next succeeding cycle is performed by the movement of, and thus is in unison with, the main carriage **100**, it is further assured that the cycle time is held to a minimum; it being remembered that this feature also effectively eliminates the need for a separate power mechanism to perform the actual stripping operation.

The rotation of at least one of the brushes **20** serves to more positively force the product into each package P being formed and the construction of this brush **20** with a single row of bristles **55** serves to yieldably vibrate the bag for providing a separate settling force on the product **15** to complement the stripping action. Also, the intermittent withdrawal of the brush **20** from engagement with the tube T, which mode of operation is afforded by the single row configuration of the brush **20**, allows the release of pressure that is generated by the stripping operation within each formed package P.

In this disclosure, there is shown and described only the preferred embodiment of the invention, but, as aforementioned, it is to be understood that the invention is capable of various changes or modifications within the scope of the inventive concept as expressed by the accompanying claims.

We claim:

1. The method of packaging porduct in a package formed from a continuous tube of sheet material comprising the steps of sealing said tube by applying a pair of sealing jaws across said tube to thereby form a first transverse seal at a sealing station, filling said package by inserting a predetermined charge of said product into said tube above said seal, releatively moving said tube with respect to said sealing station in a first direction to provide a new length of tube above said transverse seal equal to the package being formed, flattening said tube by applying a pair of brushes on opposite sides of said tube to resiliently flatten the same above said new length of tube, resiliently brushing said tube while flattened by relatively moving said brushes with respect to said tube in said first direction to strip said prdouct from the area above said new length of tube and yieldably force said product to the bottom of said package, and sealing said tube by reapplying said sealing jaws across said tube at the top of said

new length of tube to form a second transverse seal above said charge and thereby complete said package.

2. The method of calim 1 wherein at least one of said brushes is rotated during the brushing and stripping operation to urge said product into said package.

3. The method of claim 1 wherein the brushing is made intermittent by at least one of said brushes being moved into and out of engagement with said tube during the brushing and stripping operation to vibrate said package to induce settling of said product in the bottom of said package.

4. The method of claim 1 wherein said step of relatively moving said tube with respect to said sealing station and said brushing step including relatively moving said brushes with respect to said tube are performed by moving said sealing jaws and said brushes, respectively, in said first direction while engaged with said tube and wherein the step of sealing by reapplying said sealing jaws to form said second seal includes the step of moving said sealing jaws for one package length in the direction opposite to said first direction and wherein is included the additional steps of concurrently during approximately the last half of said movement of said sealing jaws in said opposite direction moving said brushes in said opposite direction and holding said brushes in a fixed position at the end of their travel in readiness for the next packaging cycle.

5. The method of claim 4 wherein said step of moving said brushes with respect to said tube in said first direction is initiated only after termination of movement of said sealing jaws in said first direction to gain maximum movement of said brushes along said tube during the brushing and stripping operation.

6. The method of claim 5 wherein said brushing and stripping step by moving said brushes in said first direction is performed concurrently with the first half of the movement of said sealing jaws in said opposite direction whereby minimum cycle time is attained.

7. The method of packaging product in a package formed from a continuous tube of sheet material comprising the steps of sealing said tube by applying a pair of sealing jaws across said tube to thereby form a transverse seal, filling said package by inserting a predetermined charge of said product into said tube above said seal, moving said jaws downwardly while engaged with said tube to provide a new length of tube above said transverse seal equal to the package being formed, flattening said tube by applying a pair of brushes on opposite sides of said tube to resiliently flatten the same above said new length of tube, resiliently brushing said tube while flattened by moving said brushes downwardly toward said sealing jaws to strip said product from above said new length of tube and yieldably force said product to the bottom of said package, releasing said sealing jaws and moving the same upwardly on a return stroke toward said brushes to the top of said new length of tube and sealing said tube by reapplying said sealing jaws across said tube to thereby form a seal above said charge and thereby form said package.

8. The method of claim 7 wherein said step of brushing by moving said brushes downwardly is performed concurrently with the first half of the movement of said sealing jaws upwardly on said return stroke whereby minimum cycle time is attained.

9. The method of claim 8 wherein said brushes are moved upwardly concurrently with said sealing jaws during the second half of said return stroke in readiness for the next packaging cycle.

10. The method of claim 7 wherein said sealing jaws are released from said tube substantially concurrently with the initiation of the brushing step by downward movement of the brushes for the stripping operation.

11. An apparatus for packaging product in a package formed from a continuous tube of sheet material comprising a pair of sealing jaws for forming a transverse seal across said tube, a stationary guideway extending parallel to said tube, a carriage for supporting said sealing jaws for movement longitudinally along said tube on said guideway, a pair of brushes extending transversely across said tube to resiliently flatten the same above the package being formed, means for moving said brushes into and out of engagement with said tube, second carriage means for supporting said brushes for movement longitudinally along said tube on said guideway, means to move said first carriage means in a first direction to provide a new length of tube during engagement of said sealing jaws and to return said first carriage means in the opposite direction during disengagement of said jaws, means for initiating movement of said second carriage means in said first direction to strip said product from the area above said new length of tube and force said product to the bottom of said package, and means for interconnecting said second carriage with said first carriage during said return stroke in readiness for the next packaging cycle.

12. The combination of claim 11 wherein is further provided means for continuously rotating one of said brushes to urge said product into the package being formed.

13. The combination of claim 12 wherein said one of said brushes includes a core and a single row of brushes extending along said core whereby upon rotation said row is brought into and out of engagement with said tube to vibrate the same and encourage said product to settle into the bottom of the package being formed.

14. The combination of claim 11 wherein is further provided dashpot means attached to said second carriage means to cause controlled movement of said brushes along said tube.

15. The combination of claim 11 wherein said second carriage means is mounted for movement along said guideway by gravity and wherein said initiating means includes latch means for releasing said second carriage means.

16. The combination of claim 15 wherein said latch means comprises a pivotal hook member and an actuator for rotating said hook member about its pivot to release the same.

17. The combination of claim 16 wherein said means for moving said brushes into and out of engagement with said tube include a pair of pivotal levers for movement of said brushes in opposed arcs toward and away from said tube, means for interconnecting said levers for simultaneous movement, and means for connecting said levers to said actuator for concurrent actuation with said latch means.

18. The combination of claim 17 wherein is further provided means on said carriage for engaging one of said levers to limit the inward movement of said brushes whereby to prevent excessive resistance between said brushes and said tube.

19. An apparatus for packaging product in a package formed from a continuous tube of sheet material comprising a pair of sealing jaws for forming a transverse seal across said tube, a stationary guideway extending parallel to said tube, a carriage for supporting said sealing jaws for movement longitudinally along said tube on said guideway, means extending transversely across said tube for movement into and out of engagement with said tube to flatten the same above the package being formed, second carriage means for supporting said flattening means for movement longitudinally along said tube on said guideway, means to move said first carriage means in a first direction to provide a new length of tube during engagement of said sealing jaws and to return said first carriage means in the opposite direction during disengagement of said jaws, means for initiating movement of said second carriage means in said first direction to cause said flattening means to strip said product from the area above said new length of tube and force said product to

the bottom of said package, and means for interconnecting said second carriage with said first carriage during said return stroke in readiness for the next packaging cycle.

20. The combination of claim **19** wherein is further provided dashpot means attached to said second carriage means to cause controlled movement of said flattening means along said tube.

21. The combination of claim **19** wherein said second carriage means is mounted for movement along said guideway by gravity and wherein said initiating means

includes latch means for releasing said second carriage means.

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