Feb. 2, 1960 C. A. FRANK ET AL 2,923,115

SEALING MECHANISM FOR PACKAGING MACHINES

Filed April 23, 1957 3 Sheets-Sheet 1

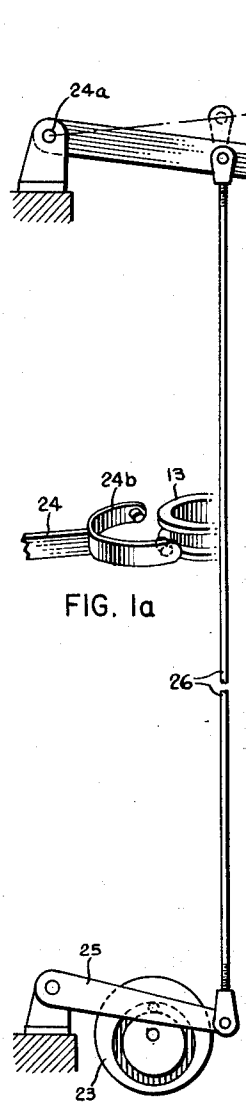


FIG. 1a

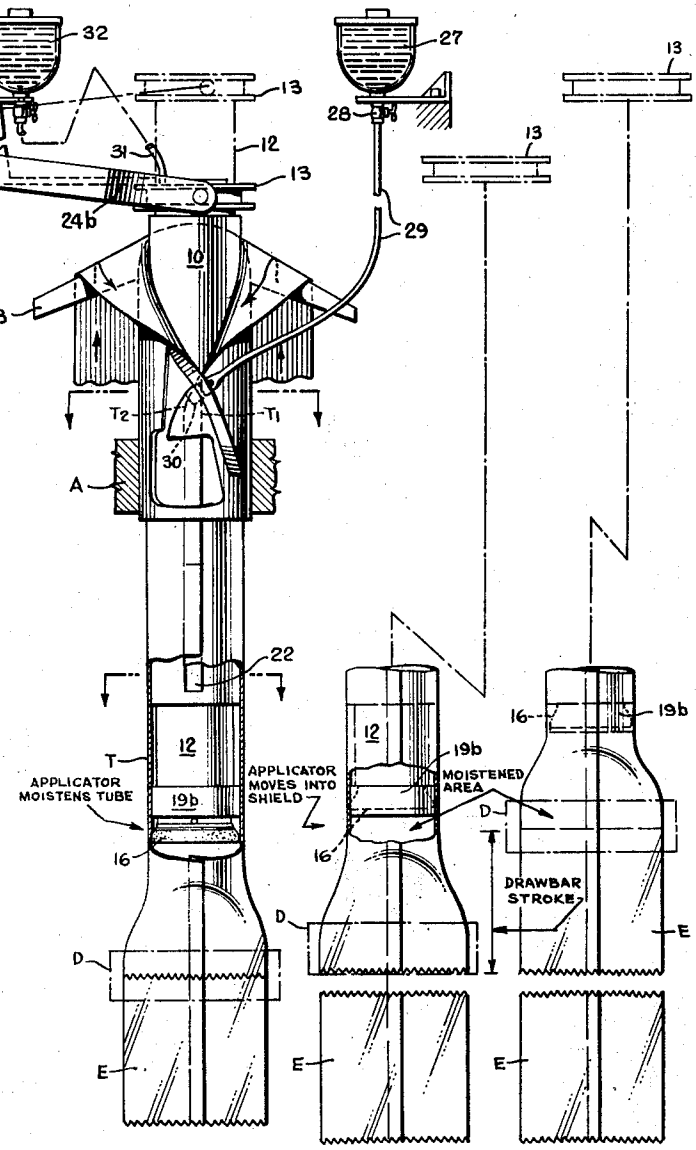


FIG. 1 FIG. 2 FIG. 3

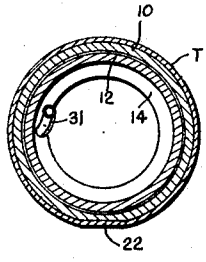


FIG. 4

INVENTORS
Joseph A. Lynch
Carl A. Frank

BY

ATTORNEY

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SEALING MECHANISM FOR PACKAGING MACHINES

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FIG. 5

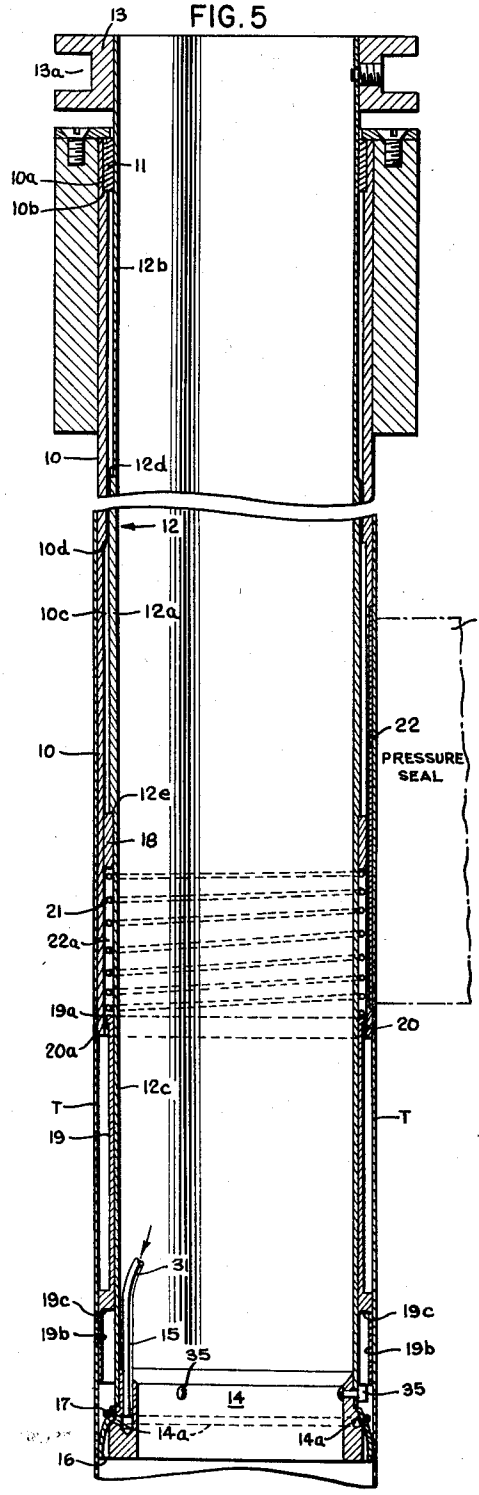
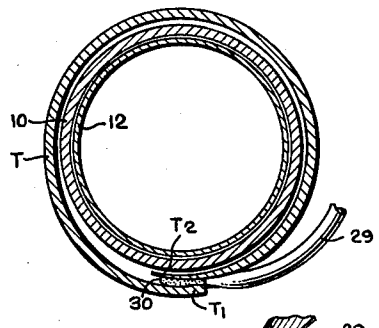


FIG. 6



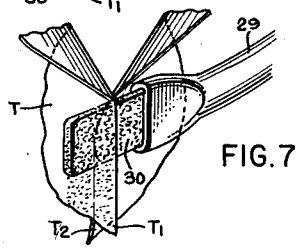
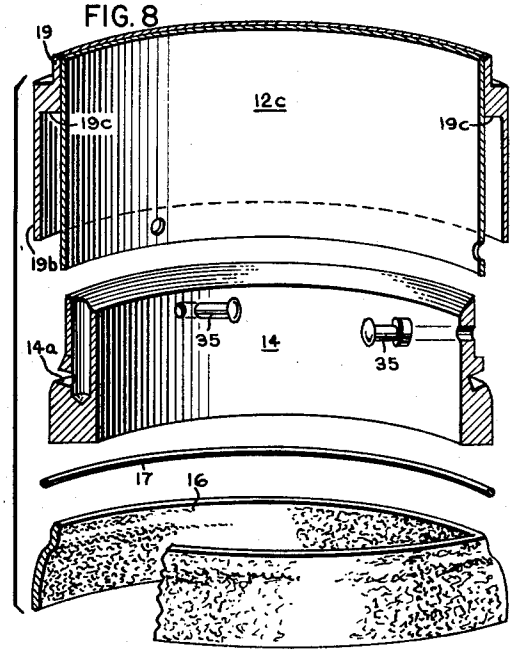


FIG. 7

FIG. 8



INVENTORS

Joseph A. Lynch

Carl A. Frank

BY

ATTORNEY

Feb. 2, 1960 C. A. FRANK ET AL 2,923,115

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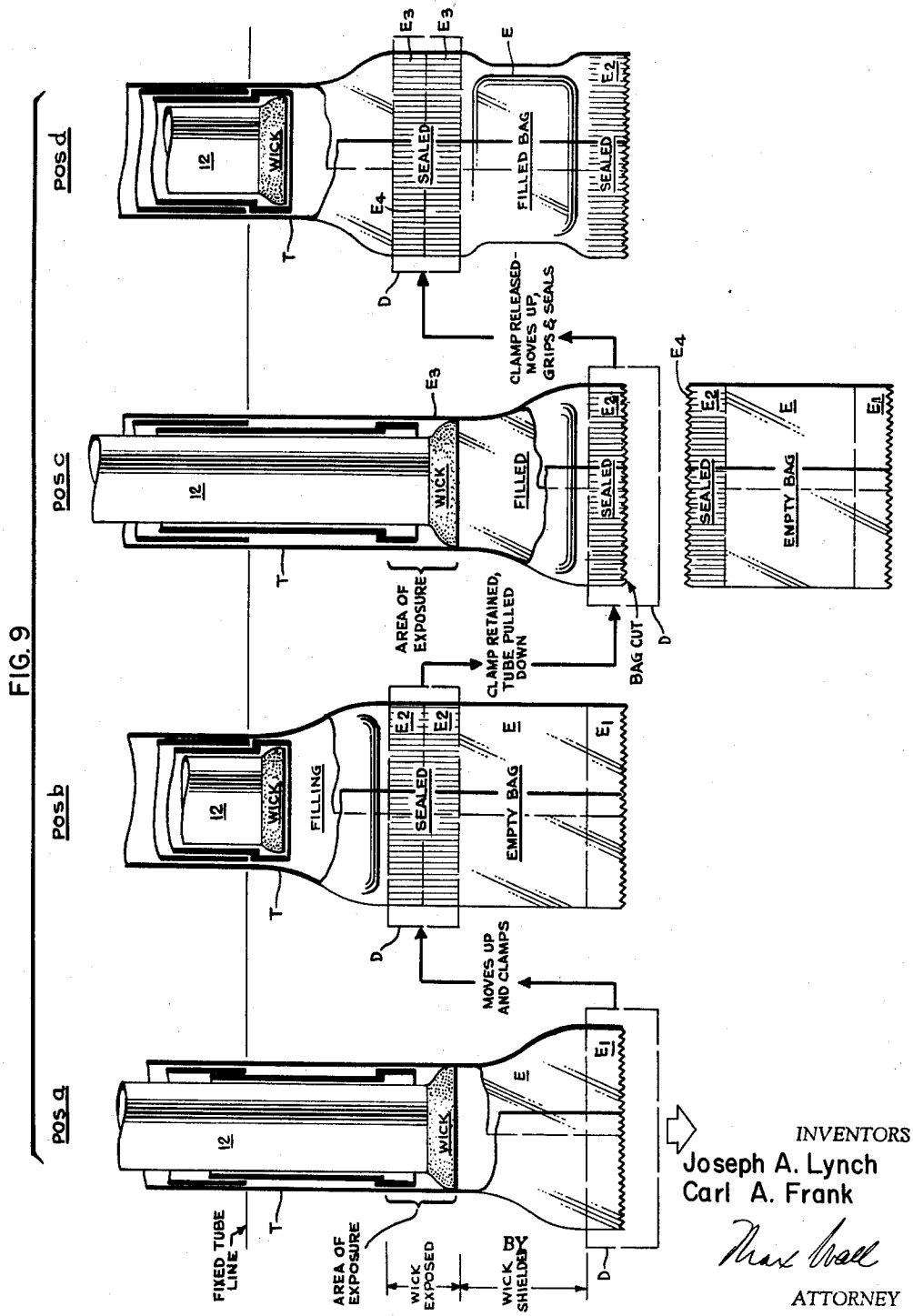


FIG. 9

INVENTORS
Joseph A. Lynch
Carl A. Frank

ATTORNEY

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2,923,115

SEALING MECHANISM FOR PACKAGING MACHINES

Carl A. Frank, Hillsdale, and Joseph A. Lynch, Washington Township, N.J.; said Lynch assignor to said Frank

Application April 23, 1957, Serial No. 654,499

52 Claims. (Cl. 53—180)

This invention relates to improvements in packaging machines. Packaging machines have been developed which form tubular containers from various kinds of packaging materials, fill them with a product, seal both ends of the container and discharge the filled, sealed container from the machine. Such a machine is shown, for example, in the patent to Zwoyer, No. 1,986,422. The demands of industry are constantly bringing forth newer and better materials for the improved handling and packing of old package products and the packaging of products not heretofore packaged by machine, or not satisfactorily packageable in the materials or by the machines available up to this time. The constant development of newer and better materials, therefore, makes possible the extension of machine packaging to such products which heretofore could not satisfactorily be packaged in materials such as cellophane, Pliofilm and the like.

In machines of the kind mentioned, it is possible to use, among others, plastic materials which are heat and pressure sensitive, such as cellophane, Pliofilm and others, as a packaging medium. Such materials are suitable for dry, fluent, granular or pellet type products, but are not suitable for the packaging of liquids, for example, which the industry has heretofore not been able to package satisfactorily in such flexible packaging materials in such machines.

The heat seal made in a machine according to the patent noted above was not effective enough to hold a liquid, and the material was too easily ruptured in handling.

New developments have recently brought forth tough, flexible, impervious materials which are strong and durable and suitable for the packaging of liquid or semi-liquid materials, such as pastes, greases and the like. One such material is a polyester film made by the E. I. du Pont de Nemours & Co., known as "Mylar." When formed into a tube or bag and sealed with a suitable medium, this material can effectively hold a liquid such as oil or water, or a semi-liquid or paste product such as a grease, for example.

An object of the present invention, therefore, is to adapt a machine, such as indicated above, for the handling of materials of this type to form a package. More specifically, the invention deals with the method and means for effectively applying a sealing medium such as a solvent or adhesive to the material at the proper place and at the proper time in the machine cycle to seal the longitudinal and transverse edges of the tube to form a package. A seal obtained merely by heat and pressure on a heat sensitive plastic such as cellophane has been found not sufficiently effective for all purposes, but in the new material mentioned herein, heat and pressure, together with the application of a suitable sealing medium to the areas to be sealed, effectively solves the problem.

According to the invention, therefore, a roll of suitable material is placed in the machine, formed into a tube with longitudinal overlapping edges, according to the teaching of the Zwoyer patent, and a sealing medium, such as a solvent or adhesive, is applied to one or more of the contacting faces of the overlapping longitudinal edges thereof as they are drawn through the tube former, prior to the heat sealing thereof which forms the tube. The sealing medium is also applied to the interior wall of the tube so formed, but only at those portions of the tube where the transverse seal will take effect to seal the lower and upper portion of the tube to form a bag or package. The tube is then effectively shielded, according to this invention, to limit the application of the sealing medium only to those portions of the tube where the seal is to take effect and to prevent the application of the sealing medium from coming into contact with those portions of the tube which are to be occupied by the product.

Another object of the invention is to incorporate novel sealing medium feeding and applying means into the tube forming and tube feeding apparatus without otherwise interfering with the operation of the machine.

Another object is to incorporate the invention into the product feeding tube in such manner that no change or only minor changes are needed in the machine to add such improved tube and accessory apparatus to the machine.

A further object is to provide means for applying the sealing medium continuously to the longitudinal seam as it is formed, but only intermittently to the transverse portions of the packaging tube during the machine cycle, the application of said medium to the transverse portions of the plastic tube being synchronized with the movement of the transverse heat sealing means so that the sealing medium is applied just before the tube is clamped by the heat sealing means.

Another problem encountered in packaging machines of the kind discussed herein occurs in the packaging of fluent and powdery materials. In passing such materials through the feed tube of the machine, a rising cloud of dust is created as the material strikes the bottom of the newly formed envelope or bag, and this dust settles on the inside wall of the tube or bag material where the next seal is to take place and forms a barrier to an effective seal. This problem is solved by the use of the present invention, as the mechanism described herein prevents the dust or powder from coming into contact with those portions of the packaging material where a seal will be made.

Therefore, still a further object of the invention is to provide, in a machine of this kind, an effective dust or powder shield for the packaging material as it is fed through the machine during the packaging process.

For the purpose of illustrating the invention, one embodiment thereof is shown in the accompanying drawings which are to be considered together with the following description.

In the drawings:

Figure 1 is a schematic view with parts in elevation and parts in section, showing the invention applied to the filler tube of a packaging machine, and showing one step in the formation of a package.

Figure 2 is a schematic development thereof, showing a second step.

Figure 3 is a schematic development showing a third step.

Figure 4 is a cross section taken along the line 4—4 of Figure 1.

Figure 5 is a vertical, sectional view taken through the filler tube of a packaging machine, showing the invention applied thereto in section.

Figure 6 is a cross section taken along the line 6—6 of Figure 1.

Figure 7 is an enlarged elevational detail of one of the solvent applying mechanisms shown in Figure 1.

Figure 8 is an enlarged, exploded view of another of the solvent applying mechanisms shown in Figure 5.

Figure 9 is a schematic diagram showing the various steps in the development of a package according to this invention.

Machines of this nature are provided with a tube former support A for the tube former B. The present support A carries a stationary outer feed tube **10** which is internally counterbored for a short distance at its upper end at **10***a*, Figure 5, to provide a shoulder **10***b* to receive and support a sleeve bearing **11**. For a substantial portion of its length from its other end, this tube is similarly internally counterbored as at **10***c* to provide a shoulder **10***d*, for a purpose which will be explained.

Slidably supported within this stationary tube **10** is an inner feed tube **12** which has a collar **13** permanently fixed thereto at its upper end, the collar having a peripheral groove **13***a*. At its lower end, Figures 5 and 8, this tube carries a feed ring **14** permanently fixed thereto, this ring having an external peripheral groove or well **14***a* to receive and store a sealing medium which is fed thereto from a tube **15**, as will be more fully explained. A flared felt applicator ring or skirt **16** encircles the feed ring and it is supported over the groove **14***a* by a resilient, split, snap-ring **17**.

The intermediate portion of the wall of the inner feed tube is greater in thickness as at **12***a* and its ends are reduced in thickness as at **12***b* and **12***c*, providing shoulders **12***d* and **12***e*, respectively. A sleeve bearing **18**, similar to the bearing **11**, is supported on the reduced extension **12***c* and is seated against the shoulder **12***e*. These bearings **11** and **18** afford a smooth antifriction support for the inner tube **12** in its reciprocating movement within the sleeve **10**, as will be described.

A sleeve or shield **19**, Figures 5 and 8 is slidably carried on the tube **12** at its lower end, this shield having an upper flange **19***a* and a lower, downwardly extending, offset skirt portion **19***b*, the offset being sufficient in radius to cover the flared felt applicator **16** when the latter is withdrawn into the skirt, as will be described.

The flange **19***a* normally rests on a stop ring **20** seated in a groove **20***a* formed for this purpose in the bore of the tube **10** at its lower extremity. A coil spring **21** is positioned in the chamber **22** between the walls of tubes **10** and **12** and is under compression between the bearing **18** and flange **19***a*, normally urging the shield **19** downwardly.

Along a portion of its length the outer tube **10** may be provided with a strip **22** of heat resistant, insulating tape, such as is sold under the trademark "Teflon," which may be permanently bonded to the tube or otherwise supported thereon in any suitable manner. The longitudinal seam sealing shoe, diagrammatically shown at S, such as is well known in packaging machines of this kind, seats against this strip under pressure to make the longitudinal seal when a tube is formed in the manner taught in the Zwoyer patent mentioned herein.

The tube **12** may be reciprocated with respect to the tube **10** in any desirable manner by a power take-off from the operating mechanism of the machine, but one manner of accomplishing this is diagrammatically shown in Figure 1. A cam **23**, which is timed for movement in synchronization with the movement of the drawbars, operates a lever **24** through any suitable system of links and levers **25**, **26**. The lever **24** may be pivoted, as at **24***a*, at one end of a stationary part of the machine. The other end of the lever **24** is forked as at **24***b*, Figure 1*a*, and the forked portion is suitably pivoted in the groove **13***a* of the collar **13**. The connecting link **26** engages the lever **24** intermediate its pivot point and the forked end, and translates the rotary motion of the cam into reciprocating motion of the lever **24**, which causes reciprocation of the inner feed tube **12**, and the sleeve **19** carried thereby, as well as the ring **14** with its wick.

As shown in Figure 5, the inner tube **12** and applicator ring **14** carried thereby are shown in their lower position, with the wick **16** exposed to apply the sealing medium to the interior of the plastic tube T. This corresponds to the lower position of the drawbars D in Figure 1. As the drawbar jaws open and begin to move up, the tube **12**, being synchronized with their movement, likewise moves upwardly, drawing the wick into the shield **19***b*, as shown in Figure 2. As the rivets **35**, Figure 5, abut against the shoulder **19***c*, the sleeve **19** is pulled upwardly, compressing the spring **21**. When the drawbars D reach the upper limit of their stroke, close, and begin to move downwardly, the tube **12** and wick **16** move in synchronism therewith by reason of the operating mechanism as shown in Figure 1, and the spring **21** forces the sleeve **19** to its starting position, with the flange **19***a* resting on stop ring **20***a*. The tube **12**, however, having a longer stroke that the sleeve **19**, continues to move downwardly, exposing the wick for another application of the sealing fluid to the interior of the tube T.

The sealing medium may be applied to the longitudinal edges T1, T2, Figure 6, of the contacting faces of the tube material T as it is pulled through the tube former B. A supply vessel **27**, Figure 1, having a valve **28** to control the feed, is connected to the tube former by means of tubing **29** which has a wick **30** compressed in its end portion, the wick extending outwardly thereof and forming the sealing means applicator for the longitudinal seal. The wick is inserted between the overlapping walls of the tube material as shown in the detail view of Figure 7, so that it is placed in contact with the inside face of the overlapping longitudinal edges of the tube material T. As said material is pulled past this point by the drawbars D, the sealing medium is applied to the tube material at the edges as indicated. The length of the wick is exaggerated in Figure 7 for the purpose of illustration.

The sealing medium is also supplied to the applicator ring groove **14***a* at the lower end of the tube **12** by means of flexible tubing **31** connected at one end to a supply vessel **32** which may be attached to the collar **13** in any suitable manner, as by a bracket **32***a*, and at its other end, the tubing is connected to the rigid tube **15**, to carry the sealing medium by gravity into the groove **14***a* of the applicator ring.

Machines of this type are adjustable to make an envelope or bag E, Figure 9, of any desired length, within suitable limits, and we will assume, merely for the purposes of illustration, that a bag having a length of 4" is to be made, and that the tube **12** (and therefore the wick **16**) will be adjusted to have a stroke of 1".

Assuming that the machine is put into operation with the drawbars (which carry the heat sealing dies and parting knife, all shown diagrammatically at D) at the upper limit of the stroke, the tube **12** would be correspondingly raised with the wick **16** retracted within the skirt portion **19***b* of the shield **19**, the shield being lifted thereby so that the flange **19***a* thereof compresses the spring **21**. Assuming further that a tube T of packaging material (requiring a solvent or adhesive to form an effective seal) has been formed and has been pulled down manually to a position below the wick **16** and within the reach of the drawbars. With the vessels **32** and **27** filled with a suitable medium for sealing, the drawbars are put into operation and the drawbars close on the end of the tube to make the first seal E1, Figure 9, without the application of the sealing medium to that particular part of the tube, and pull the tube downwardly. This seal is ineffective and the piece will be discarded. As the drawbars reach the last quarter of the downward stroke, the tube **12**, being synchronized with the movement of the drawbars, is moved downwardly to expose the wick **16**, Figure 1, which applies a liquid sealing agent to the in-

terior wall of the tube T, but only to that area E1 which forms the lower portion of the tube T and the upper edge of the first bag E, which will be discarded. The drawbars are now at the lower limit of the stroke and the relative position of the parts is shown in Figure 1, and more clearly in Figure 9 at position *a*. As the drawbars reach the lower limit of the stroke, the gripping jaws open and move upwardly, preparatory to making the next seal at E2, which will be the first effective seal, the inner wall of the tube T having been moistened with the sealing medium. As the drawbars approach the upper limit of the stroke (3" movement) the wick **16** is retracted into its shield (1" movement). This is the relative position of the parts shown in Figure 2, with the drawbar D on its upward stroke. As the drawbars reach the upper limit of the stroke, the jaws close on the tube T at the area E1 where the tube was moistened, and form the transverse or end seal at E2. This is shown at position *b*, Figure 9.

The longitudinal seam has meanwhile been prepared by the moistening of the adjacent edges of the tube T at the folding mechanism by the wick **30** as discussed above, and the seal is effected by the sealing shoe S in the manner well known in the art as the tube T is pulled past the sealing shoe.

As the drawbars close and form the transverse seal E2, the product may be dropped into the tube as the drawbars move on the next downward stroke. As the drawbars approach the lower limit of the stroke (3" movement) the wick begins its downward stroke (1" movement). The wick and drawbars simultaneously complete their stroke, the drawbars thus completing the four inch movement. The wick has now applied the sealing medium to that portion of the tube T which forms the upper transverse portion E3 of the final package. This is illustrated at position *c*, Figure 9. The drawbars now open and release their grip on the portion E2 of the completed, empty, bag E and drop it. They then move up to grip the tube T along the portion E3, which has been moistened, as shown in position *d*, Figure 9. As the product had already been dropped into the partially formed bag, the drawbars grip it, seal it, and sever it from the remaining upper portion of the tube along the serrated line E4, forming a completed package. This is the position of the parts shown in Figure 3. When the drawbars open to begin their upward movement to start a new cycle, the completed and filled package E drops from the machine.

Any suitable packaging material may be used on the apparatus disclosed herein, with or without the use of a sealing medium as disclosed. If the sealing medium is not desired where, for example, a seal is made by heat and pressure alone, the sealing medium is evacuated from the supply vessels **27**, **32**, or the valves may be closed, and a seal is made by heat and pressure alone.

It is an important feature of this invention that when it is used without the sealing medium, the felt applicator ring forms an effective dust or powder shield to prevent dusty or powdery materials from penetrating outside the confines of the bag E as the material is dumped into it. The felt ring **16** forms an effective barrier to the rise of dust or powder above it, and prevents such dust or powder from coming into contact with those new portions of the tube T which will subsequently form successive sealing areas. The presence of such dust or powder on the walls of the material at those portions prevents the formation of an effective seal, but with the use of the apparatus described, the problem is eliminated.

Changes may be made in the design and construction of the invention without departing from the spirit thereof as defined by the appended claims.

We claim:

1. In a packaging machine of the type which pulls a film of packaging material around the feeding tube of the machine to form a tube, fills the tube with a product and seals same at each end of the product to define a package, the combination comprising a feeding tube and means for supplying a sealing medium for the film material to the interior wall of said tube of packaging material at said end areas only, after said formed tube passes said feeding tube.

2. In a packaging machine of the type which pulls a film of packaging material around the feeding tube of the machine to form a tube, fills the tube with a product and seals same at each end of the product to define a package, the combination comprising a feeding tube and means for intermittently applying a sealing medium for the film material to spaced portions of the interior wall of said formed tube as said formed tube passes said feeding tube.

3. In a packaging machine of the type which pulls a film of material around the feeding tube of the machine to form a tube, fills the tube with a product and seals same at each end of the product to define a package, the combination comprising a feeding tube and means for applying a sealing medium for said film material to the interior wall of said formed tube circumferentially thereof at said end areas only, as said formed tube passes said feeding tube.

4. In a packaging machine of the type which pulls a film of material around the feeding tube of the machine, seals the longitudinal edges of the film to form a tube, fills the tube with a product and seals same at each end of the product to define a package, the combination comprising a feeding tube, means for supplying a sealing medium for the film material to the interior wall of said feed tube, and means carried by said feeding tube operative to apply said sealing medium to the interior of said formed tube at said sealing areas only, as said formed tube passes said feeding tube.

5. A device according to claim 4 in which the sealing medium applicator is supported within the feeding tube.

6. A device according to claim 4 in which said sealing medium applicator comprises a wick.

7. A device according to claim 4, in which said sealing medium applicator comprises a circular wick intermittently movable into and out of contact with said film material.

8. In a packaging machine of the type making a tube from a film of material, filling it with a product and sealing it at each end of the product, the combination comprising a feed tube, means for forming a tube of said film of material about said feed tube, means for supplying a sealing medium to the interior of said feed tube, and means for applying said sealing medium to those areas of said packaging material where the seals are made when said tube is formed into a package.

9. In a packaging machine of the type making a tube from a film of material, filling it with a product and sealing it, the combination comprising a feed tube, means for forming a tube of said film material about said feed tube, means for supplying a sealing medium for said packaging material to the interior of said feed tube, means for applying said sealing medium only to those areas of said packaging material where the seals are to be made and means for shielding from the sealing medium those areas of the packaging material which come in contact with the product.

10. In a packaging machine of the type having a feed tube around which a tube of packaging material is formed, filled with a product and sealed at each end of the product, said machine having means for gripping and drawing said tube of packaging material and sealing it transversely, the combination comprising means for applying a sealing medium to those areas of the packaging tube gripped by the drawing means, and means for shielding the sealing medium applicator from adjacent portions of said tube, the applicator lying within the tube, said sealing medium applicator means being synchronized

with the movement of the drawing means so that the sealing medium is applied as the drawing means is completing its stroke.

11. In a packaging machine of the type having a feed tube around which a tube of packaging material is formed, filled with a product and sealed at each end of the product, said machine having means for gripping and drawing said tube of packaging material and sealing it transversely, the combination comprising means for applying a sealing medium only to those areas of the packaging tube gripped by the drawing means, and means for shielding the applicator means from adjacent portions of the tube, said shielding means being interposed between the feed tube and the tube of packaging material.

12. In a packaging machine having a feed tube and means for feeding a web of packaging material around said feed tube to form a packaging tube, the combination comprising means for applying a sealing medium to a portion of the interior of said packaging tube as it is drawn from said feed tube, means for gripping said portion, sealing and drawing it, means to shield the package tube from said applying means while the package tube is being drawn and filled with a product, said applying means applying said sealing medium to an area of the interior of said packaging tube above the product just prior to sealing said latter area.

13. In a packaging machine of the type forming a packaging tube from a moving film of material around the product feeding tube of the machine, sealing one end of the packaging tube, filling it with a product and sealing it at its other end, the combination comprising a feeding tube, means carried by the feeding tube at its lower end for applying a sealing medium to selected areas of the interior of the packaging tube as it passes the feeding tube, and means connected to the driving mechanism of the machine for operating said applying means.

14. In a packaging machine of the type forming a packaging tube from a moving film of material around the product feeding tube of the machine, sealing one end of the packaging tube, filling it with a product and sealing it at its other end, the combination comprising a feeding tube, means on the tube for applying a sealing medium to areas above and below the product occupying area of the packaging tube as it passes the feeding tube, and means for operating said applying means.

15. A device according to claim 14 in which the operating means is connected to the driving mechanism of the machine.

16. In a packaging machine of the type forming a packaging tube from a moving film of material around the product feeding tube of the machine, sealing one end of the packaging tube, filling it with a product and sealing it above the product, the combination comprising a feeding tube, means for pulling said packaging tube past said feeding tube, means on said feeding tube for applying a sealing medium to areas above and below the product occupying area of the packaging tube as it passes the feeding tube, the movement of said applying means being synchronized with the movement of the pulling means so that the sealing medium is applied in each instance as the tube is pulled.

17. In a packaging machine having a feed tube and means for feeding a web of packaging material past said feed tube to form a packaging tube, the combination comprising means for applying a sealing medium to circumferential, selected areas of the interior of said packaging tube as it passes beyond said feed tube.

18. A machine according to claim 17, in which said applying means is within the packaging tube.

19. A device according to claim 17, in which said applying means comprises a wick.

20. A device according to claim 17, in which said applying means comprises a wick supported by said feed tube.

21. A device according to claim 17, in which said applying means comprises a wick and means for supplying a sealing medium to said wick.

22. In a packaging machine of the type handling fluent and powdery materials, the combination comprising a feed tube, said tube adapted to support a film of packaging material as said material is folded into a packaging tube, moved past said feed tube, filled with a product and sealed, means for applying a sealing medium to the interior wall of said packaging material below said feed tube after said packaging material is formed into a tube, and means for gripping and pulling said packaging tube past said feed tube.

23. In a packaging machine of the type handling fluent and powdery materials, the combination comprising inner and outer feed tubes, said outer tube adapted to support a film of packaging material as said material is folded into a tube, moved past said feed tubes, filled with a product and sealed at each end, means on the inner tube for applying a sealing medium to the interior wall of said packaging material as it is formed into a tube, and means for gripping and pulling said tube past said feed tubes.

24. A packaging machine according to claim 23, in which said applying means comprises a wick.

25. A packaging machine according to claim 23, in which said applying means comprises a wick and a sealing medium supply source, said source feeding said wick.

26. A packaging machine according to claim 23, in which said applying means comprises a wick and a sealing medium supply source, said source comprising a ring on said inner feed tube.

27. A packaging machine according to claim 26, in which the wick is circular and is supported on said ring.

28. A packaging machine according to claim 23, in which the sealing medium applying means is intermittently actuated to apply said medium to selected areas of said packaging material, the action of said applying means being synchronized with that of said gripping and pulling means, so that the applying means becomes operative only after the pulling of the tube has started.

29. A packaging machine according to claim 23, in which a shield is provided for said applying means, said applying means being withdrawn into said shield prior to the gripping of said tube by said gripping and pulling means.

30. A packaging machine according to claim 23, in which a shield is provided for said applying means, and said packaging material is intermittently shielded from said applying means.

31. A packaging machine according to claim 23, in which a shield is provided for said applying means, and said packaging material is intermittently shielded from said applying means, the operation of said shield being synchronized with the movement of said pulling means whereby the applying means becomes shielded as the pulling means moves to grip said packaging material.

32. In a packaging machine, the combination comprising a feed tube adapted to support a film of packaging material as said material is folded into a tube, pulled past said feed tube, filled with a product and sealed, reciprocable means for pulling said packaging tube, reciprocable means for applying a sealing medium to circumferential areas of the interior wall of said packaging tube after it has been formed, and means for synchronizing the movement of said pulling means and applying means so that the sealing medium is applied as the packaging tube is pulled past the lower end of the feed tube.

33. A device according to claim 32 in which the applying means is supported by said feed tube and reciprocates with respect thereto.

34. A device according to claim 32 in which a shield is applied to the applying device to shield same from the packaging tube during a portion of the stroke of said pulling means.

35. A device according to claim 32 in which a shield is applied to the applying device to shield same from the

packaging tube during a portion of the stroke of said pulling means and is actuated only as the pulling means approaches the end of its pulling stroke.

36. A dust sealing device for packaging machines handling fluent and powdery materials comprising inner and outer feed tubes, said outer tube adapted to support a film of packaging material as said material is folded into a tube and moved past said feed tubes to be formed into bags, filled with a product and sealed at each end of the product, shielding means on said inner tube movable into and out of engagement with said film tube to seal a selected area of the interior wall of said film tube against dust caused by the discharge of a fluent material into said feed tube, and means to retract the dust shield from said film tube while said selected area of said film is moved past said shield.

37. A dust seal for packaging machines handling fluent and powdery materials comprising inner and outer feed tubes, said outer tube adapted to support a film of packaging material as said material is folded into a tube and moved past said feed tubes to be formed into bags, filled with a product and sealed at each end of the product, said inner feed tube extending below the lower extremity of said outer tube, means carried by one of said tubes to seal a selected area of said film against dust caused by the discharge of a fluent material into said inner tube, and means to shield the dust sealing means from said film while the selected of said film is moved past said shield.

38. A device according to claim 37, in which said sealing means comprises a yieldable skirt attached to said inner tube, said skirt engaging the interior wall of said tube to prevent the passage of dut particles past said skirt.

39. A device according to claim 37, in which said dust sealing means is automatically, intermittently covered by said shield.

40. A sealing means for a packaging machine comprising a feed tube, said tube adapted to support a film of packaging material as said material is folded into a packaging tube and is moved past said feed tube, and means supported within said feed tube to apply a sealing medium to selected areas of the interior of said film as it passes said feed tube.

41. A sealing means for a packaging machine comprising an outer feed tube, said tube adapted to support a film of packaging material as said material is folded into a packaging tube and is moved past said feed tube, an inner feed tube movable within said outer tube and extending below said outer tube, sealing medium applying means carried by said inner tube to apply sealing medium to said film as it is moved past said inner tube, and means for shielding said applying means from said film.

42. A sealing means according to claim 41, in which the shielding means is carried by said inner tube.

43. A sealing means according to claim 41, in which the shielding means is supported between the inner and outer tube.

44. A sealing means according to claim 41, in which the shielding means comprises a sleeve about said inner tube with a downwardly extending skirt at its lower end, said skirt being adapted to enclose said applying means when the inner tube is raised.

45. A device according to claim 41, in which the sealing medium applicator comprises a wick carried at the lower end of the inner tube.

46. A device according to claim 41, in which the inner tube carries a wick and means for supplying a sealing medium to said wick.

47. A device according to claim 41, in which the applying means comprises a wick support, a wick seated on said support, and a reservoir in said support for feeding said wick.

48. A device according to claim 41, in which the sealing medium applying means comprises an applicator ring fixed to said inner tube, with a wick carried by said ring, and means in said ring for feeding said wick.

49. Dust shielding means for a packaging machine comprising an outer feed tube, said tube adapted to support a film of packaging material as said material is folded into a packaging tube and is moved past said feed tube, an inner feed tube movable within said outer tube and extending below said outer tube, dust shielding means carried by said inner tube in contact with the inner wall of the packaging tube, and means for withdrawing said shield from said packaging tube.

50. The method of applying a sealing medium to a packaging tube comprising forming a packaging tube around a feed tube and moving it past said tube, and applying an adhesive to selected, circumferential areas of the interior of said packaging tube as the latter tube moves past the end of said feed tube.

51. The method of claim 50 in which the adhesive is applied periodically.

52. The method of applying a sealing medium to a packaging tube comprising forming a packaging tube around a feed tube and moving it past said tube, and applying an adhesive carrying wick to selected circumferential areas of the interior of said packaging tube as it moves beyond the end of said feed tube.

References Cited in the file of this patent

UNITED STATES PATENTS

2,257,823	Stokes	Oct. 27, 1941
2,294,220	Albertson	Aug. 25, 1942
2,419,982	Zwoyer	May 6, 1947
2,766,568	Tasker	Oct. 16, 1956