Feb. 6, 1968 H. S. V. JÄRUND 3,367,087

APPARATUS FOR AUTOMATICALLY FILLING AND SEALING TUBULAR PACKING MATERIAL

Filed June 18, 1965

Fig.1

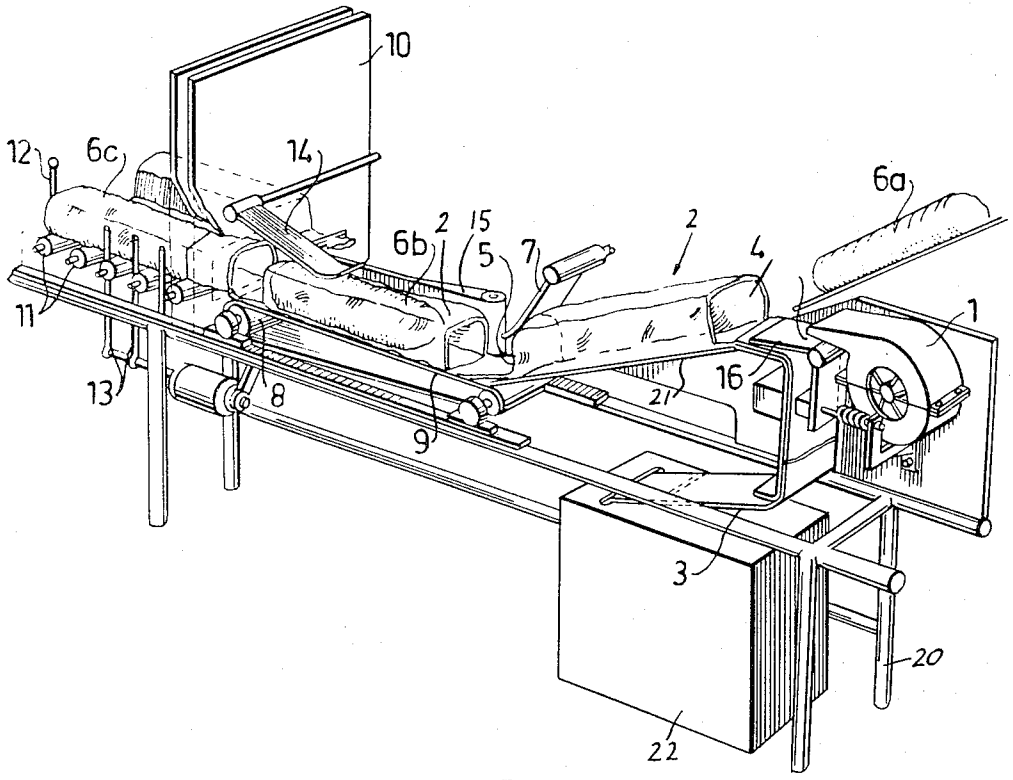
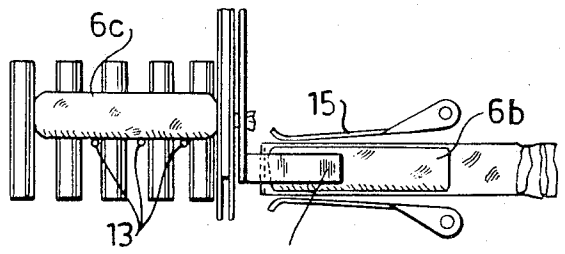


Fig.2



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United States Patent Office 3,367,087
Patented Feb. 6, 1968

3,367,087

APPARATUS FOR AUTOMATICALLY FILLING AND SEALING TUBULAR PACKING MATERIAL

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Filed June 18, 1965, Ser. No. 464,983
Claims priority, application Sweden, June 22, 1964, 7,562/64
10 Claims. (Cl. 53—188)

ABSTRACT OF THE DISCLOSURE

A packaging conveyor carrying a continuous band which connects pockets having a leading closed end and a trailing open end. A stream of air directed against the open end inflates the pocket for insertion of goods, and the inserted goods actuate the starting switch of the conveyor. When the trailing end reaches a sealing station, the closed end actuates a switch which stops the conveyor and energies deflectors which move the sealed pocket laterally of the conveyor, thereby tearing it from the next pocket which is laterally secured by guide plates.

The present invention relates to filling, separating, and sealing of packing spaces or pockets situated successively after each other in a tube and being individually attached to each other, and more particularly to improved apparatus wherein the tube is fed by means of an endless conveyor band on a support and the opening of one packing space or pocket at a time is effected, whereupon the goods to be packed are inserted in the opening thus formed and then the filled packing spaces are successively separated from the tube and sealed.

Heretofore, filled packing spaces of such a tube or bag band have been torn off from each other and have then been sealed in a known manner. Even though the packing spaces, due to the special shape of the bag band, could be filled in a continuous working operation, it has been impossible to take advantage of the time thus gained because it has not been possible to effect automatic sealing and separation of each packing space.

Accordingly, an object of the present invention is to provide apparatus which overcomes the prior difficulties and disadvantages.

Another object is to provide such apparatus which lends itself to automatic operation.

Still another object is to provide such apparatus which has a high production rate.

A further object is to provide such apparatus which is simple and economical in construction and is reliable in operation.

To the accomplishment of the foregoing and other objects which will hereinafter appear, my invention consists in the apparatus elements and their relation one to the other, as hereinafter are more particularly described in the specification and sought to be defined in the claims.

In accordance with the present invention, the foregoing objects are generally accomplished by apparatus including conveyor means for moving the tubular material or bag band in its lengthwise direction, means for successively opening the packing spaces to enable goods to be inserted therein, a sealing station downstream of the opening means and adjacent one side of the conveyor means, means at the upstream side of the sealing station for holding a filled packing space, and means at the downstream side of the sealing station for engaging a filled packing space in advance of and connected to the packing space being held, and for moving the engaged packing effect detachment of the two packing spaces and to present the leading packing space to the sealing station.

According to a preferred embodiment of the invention, automation of the sealing and separation of each packing space may be attained whereby the actually filled packing space by means of a switch starts a driving roller for the conveyor so that at least one previously filled packing space on the conveyor is conveyed to the sealing station and via driving rollers is situated along the length of the conveyor. This packing space engages a switch which temporarily stops the feeding movement of the conveyor whereupon the packing space or pocket situated at the sealing station, by means of members arranged displaceably between said driving rollers, is moved in lateral direction and is torn off from the bag band.

The invention will now be described in detail with reference to the accompanying drawing wherein:

FIG. 1 is a perspective view of preferred apparatus for carrying out the present invention; and

FIG. 2 is a fragmentary plan view of a detail of the apparatus shown in FIG. 1.

The conveyor of the invention has a frame **20** on which a support **21** rises upwardly from a storage container **22** and then slopes obliquely downward toward a horizontal conveyor belt **9** trained over rollers **8**. A band **3** is drawn from the container **22** over the support **21** when the conveyor belt **9** moves. The band integrally connects pockets **2** which are elongated longitudinally of the band and constitute packing spaces having each a trailing open end **4** and a leading closed end **5**.

A blower **1** discharges air against the open end **4** of each pocket **2** when the end **4** is located at the highest point of the support **21**, thereby inflating the pocket for insertion of goods **6***a*. The inserted goods strike the actuating arm of a switch **7** near the bottom end of the sloping portion of the support **21**.

The switch **7** is an element of the drive mechanism for the belt **9** which also includes the rollers **8** and is not otherwise shown. Engagement of the switch **7** by the inserted goods starts movement of the conveyor belt **9**.

The conveyor belt **9** extends the lower end of the sloping portion of the support **21** to a sealing station **10**, more fully described in my simultaneously filed application Ser. No. 464,984, now abandoned. While supported on the belt **9**, a pocket **2** filled with goods **6***a* is laterally secured by guide plates **15**, and is held down on the belt by an arm **14**.

Spaced rollers **11**, connected to the drive of the rollers **8** in a non-illustrated manner, lead horizontally from the sealing station **10** to a switch **12**, and accommodate a pocket filled with goods **6***c* in such a manner that the trailing end of the pocket is in the sealing station **10** when the leading closed end strikes the actuating arm of the switch **12**. The switch **12**, when engaged, stops the drive of the rollers **8**, **11**.

Deflector rods **13** project upwardly between the rollers **11** in a row. They are mechanically connected to each other and to an electrically operated actuator, not shown in detail, and operated by the switch **12**. The actuator moves the rods axially of the rollers **11** from the position shown in FIG. 1 to that illustrated in FIG. 2 when the switch is actuated.

A clamping member **16** movably mounted on the frame **20** normally clamps the band **3** against the support **21**. It is electrically operated in a manner not further illustrated to release the band **3** when the switch **8** is actuated to start the rollers **8**, **11**.

The afore-described apparatus operates as follows:

Starting from the position illustrated in which three pockets **2** respectively stand ready to receive the goods **6***a* and hold the goods **6***b* and **6***c*, the goods **6***a* are inserted into the pocket **2** on the sloping portion of the support **21**. As the inserted material strokes the switch **7**, the clamping member **15** is released, and the rollers **8**, **11**

are started to move the goods **6***b* from the position shown in FIG. 2 through the sealing station **10** and into engagement with the switch **12** while the goods **6***a* and the enveloping pocket **2** are drawn into the channel defined by the belt **9** and the guide elements **14, 15.**

As the leading end of the pocket holding the goods **6***b* strikes the switch **12**, the clamping member **16** is applied to the tape **3** to arrest the same while the rollers **8, 11** are being stopped. Simultaneously, the sealing station **10** seals the trialing end of the pocket in the station by tying it with a sealing band in a manner more fully disclosed in the afore-mentioned application. The rods **13** move laterally between the rollers **11** to shift the newly sealed pocket and its contents laterally into the position shown in FIG. 2, thereby tearing the band **3** which so far connected the sealed pocket to the next pocket secured against lateral movement between the guide plates **14, 15.**

A sealed pocket shifted laterally in a precious operation, as shown in FIG. 1, is discharged by the lateral movement of the next sealed pocket.

The electrical circuits and networks of the conveyor drive and some mechanical components thereof have not been shown because such details are within the ordinary skill of a person familiar with the art.

This invention has been described for purposes of illustration only and is not intended to be limited by this description. Instead, many changes and modifications may be made without departing from the spirit of the invention as defined in the appended claims.

I claim:

1. In apparatus for filling, separating and sealing tubular material provided with packing spaces or pockets arranged successfully in the lengthwise direction and being detachably connected, conveyor means for feeding the material in the lengthwise direction, means for successively opening the packing spaces to enable goods to be inserted therein, a sealing station downstream of said opening means and adjacent one side of said conveyor means, means at the upstream side of said sealing station for holding a filled packing space, and means at the downstream side of said sealing station for engaging a filled packing space in advance of and connected to the packing space being held and for moving the engaged packing space laterally with respect to the held packing space to effect detachment of the two packing spaces and to present the leading packing space to said sealing station.

2. In apparatus according to claim **1**, where said opening means is a blower for inflation the packing spaces.

3. In apparatus according to claim **1**, including first switch means for starting said conveyor means when engaged by the leading end of a filled packing space, and

second switch means for stopping said conveyor means when engaged by the leading end of the packing space downstream of the sealing station.

4. In apparatus according to claim **3**, wherein said holding means and said means for laterally moving the packing space downstream of the sealing station are rendered effective by said second switch means.

5. In apparatus according to claim **3**, including means for clamping the tubular material upstream of the packing space being opened, said clamping means being rendered effective by said first switch means.

6. In apparatus according to claim **1**, wherein said holding means includes a top member and a pair of side members for engaging the filled packing space upstream of the sealing station.

7. In apparatus according to claim **1**, wherein said last mentioned means include a plurality of rollers for supporting the leading filled packing space, and a pluraity of members for engaging the packing space each positioned in and extending through a space between adjacent rollers and being movable in the space in a lateral direction.

8. In apparatus for separating and sealing filled packing spaces arranged successively in the lengthwise direction and being detachably connected, a sealing station, means at the upstream side of said sealing station for holding a filled packing space, and means at the downstream side of said sealing station for engaging a filled packing space in advance of the packing space being held and for moving the engaged packing space laterally with respect to the held packing space to effect detachment of the two packing spaces and to present the leading packing space to said sealing station.

9. In apparatus according to claim **8**, including switch means engaged by the leading end of the leading packing space for controlling operation of said last mentioned means.

10. In apparatus according to claim **8**, wherein said last mentioned means include a plurality of rollers for supporting the leading filled packing space, and a plurality of members for engaging the packing space each positioned in and extending through a space between adjacent rollers and being movable in the space in a lateral direction.

References Cited

UNITED STATES PATENTS

3,254,468 6/1966 Lerner ---------- 53—385 X

FOREIGN PATENTS

222,038 6/1962 Austria.

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