B. W. TUCKER.

MECHANISM FOR FEEDING CONICAL TUBES.

APPLICATION FILED FEB. 15, 1904.

900,900.

Patented Oct. 13, 1908.

2 SHEETS—SHEET 1.

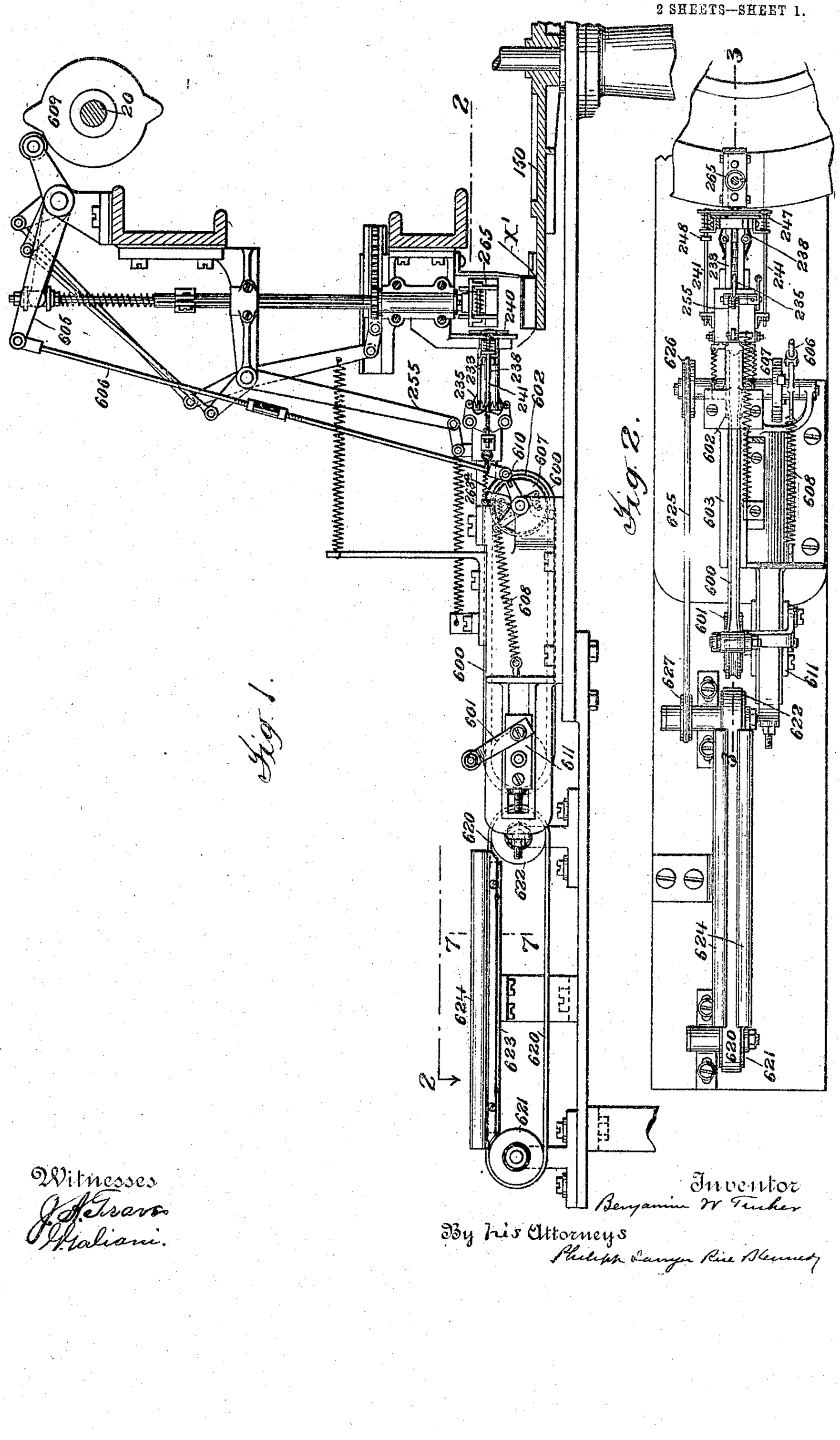

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Fig. 3.

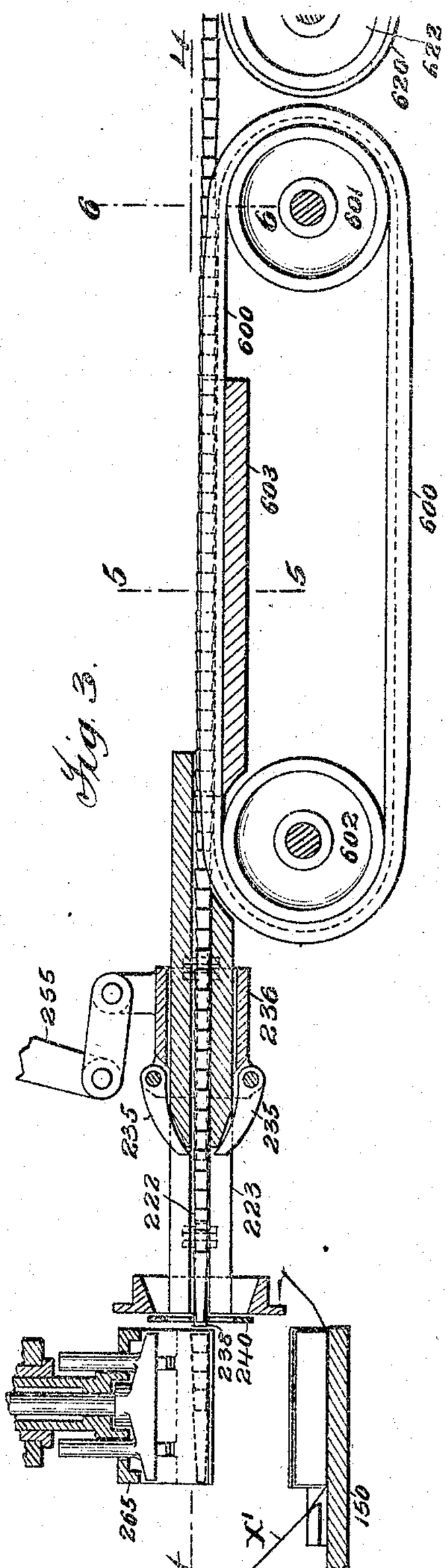


Fig. 4.

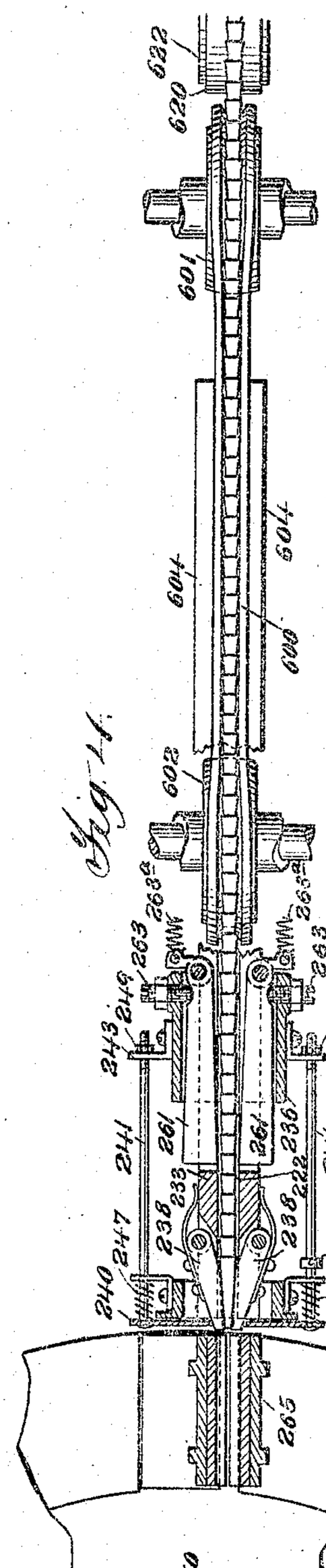


Fig. 7.

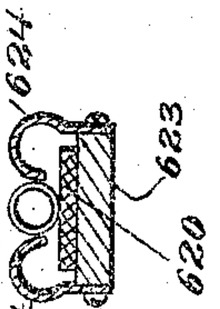


Fig. 6.

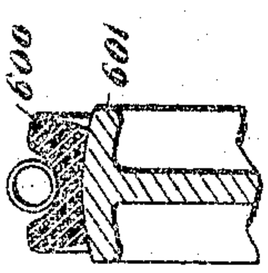
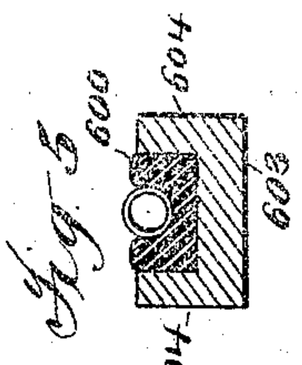


Fig. 5



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UNITED STATES PATENT OFFICE.

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MECHANISM FOR FEEDING CONICAL TUBES.

No. 900,900. Specification of Letters Patent. Patented Oct. 13, 1908.

Application filed February 15, 1904. Serial No. 193,486.

To all whom it may concern:

Be it known that I, BENJAMIN W. TUCKER, a citizen of the United States, residing at Newark, county of Essex, and State of New Jersey, have invented certain new and useful Improvements in Mechanism for Feeding Conical Tubes, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

This invention relates to means for feeding successive bunches of a predetermined number of nested conical tubes, such as the conical mouthpieces or holders for cigarettes.

The invention has been made especially with the idea of providing mechanism for feeding cigarette holders in bunches of a desired number of holders each to packing mechanism by which the holders are packed with cigarettes in boxes or packages, and especially to provide holder feeding mechanism adapted to be applied to the packing machine for which an application for Letters Patent of the United States was filed by me on the 30th day of September, 1902, Serial No. 125,419. It will be understood, however, that features forming the present invention are not limited to use in connection with or as part of such a machine, but may be employed for feeding other conical tubes or in connection with other machines to which they may be applicable.

By the machine of my said application packages of cigarettes are deposited in partially formed boxes carried by a boxing carrier, and a charge of holders is then deposited in each box beside the package of cigarettes, and the folding of the box is then completed and the folded box inserted into a sheath or tubular cover and delivered from the machine. The holders in the machine shown in said application are fed from a hopper or magazine and formed into a nested row which is advanced to counting and feeding devices by which bunches of a predetermined number of holders are fed from the row of nested holders to a carrier by which the bunches of holders are deposited in charges of two each into the boxes beside the packages of cigarettes.

The present invention aims to improve the holder feeding mechanism generally and to provide such mechanism to which the holders may be conveniently supplied by hand.

As a full understanding of the invention can best be given by a detailed description of a preferred construction embodying the various features thereof, such a description will now be given in connection with the accompanying drawings showing a preferred embodiment of the invention applied to the machine of my said application No. 125,419.

In said drawings:—Figure 1 is a side view partly in section showing so much of the machine as is required to illustrate the present invention. Fig. 2 is a section on line 2 of Fig. 1. Fig. 3 is an enlarged vertical view taken on line 3 of Fig. 2. Fig. 4 is a view taken on line 4 of Fig. 3. Figs. 5 and 6 are detail cross-sectional views taken on lines 5 and 6 respectively of Fig. 3. Fig. 7 is a detail cross-sectional view taken on line 7 of Fig. 1 but on the scale of Figs. 3 to 6.

Referring to the drawings, 150 represents the boxing carrier by which the partially folded boxes X′ each with a package of cigarettes therein are presented successively in position to receive a charge of holders from the carrier or depositing plunger 265. These parts are or may be constructed and operated as more fully shown and described in my said application No. 125,419. As they form no part of the present invention they need not be further described.

As in the machine shown in my said application No. 125,419, the holders are fed to the carrier in bunches of five each from a channel 222 formed in a channel bar 223, to which channel the row of nested holders is fed by means hereinafter described. The bunches of holders are fed from the channel and delivered to the carrier by means of a feeding gripper comprising a pair of spring actuated jaws 235 carried by a slide 236, said jaws having access to the line of holders through slots in the channel bar 223. The jaws 235 are preferably pivoted to the slide and connected to move in unison as by gear segments, as shown in Fig. 1. The forward movement of the column of holders in the channel 222 is normally limited by means of a pair of jaws 238 mounted in slots in the channel bar and placed at right angles to the jaws 235, and which jaws are normally held in their closed position by means of a lock plate 240 mounted to have a movement longitudinally of the channel 222 and having an opening therein of a width in one direction such that its edges will bear on the jaws 238 to close them when the plate is moved toward the

jaws and extended in the other direction sufficiently to permit the projection of the ends of the feeding jaws 235 therethrough. The plate 240 is carried by sliding rods 241 which are guided by stationary supports at the end toward the plate and by brackets 243 on the slide 236. The plate is under tension, as by springs 247, to move forward to release the holding jaws 238, its forward movement being limited by a stop 248, and it is normally held in its jaw closing position by engagement of the brackets 243 with stops 249 on the rods 241, as shown in Fig. 4, the slide 236 being normally held in its retracted position, as shown in this figure. When the slide is in its retracted position, the feeding jaws 235 are held slightly apart, as by engagement with shoulders of the channel bars 223, as shown in Fig. 3, to permit the feeding of the column of holders between the jaws. The slide 236 is reciprocated by means of a lever 255 one arm of which is connected to the slide by a link and which may be oscillated as described in my said application No. 125,419.

As the slide moves forward, the feeding jaws 235 approach each other as the slide begins its forward movement and engage the rear end of the fifth holder in the channel, the machine being constructed to feed the holders to the carrier in bunches of five, and then feed the bunch of five holders forward and from the channel into the carrier, the plate 240 having been allowed to move under the tension of its springs 247 to release the jaws 238 and permit the holders to be fed past said jaws. The main portion of the column of holders in the channel 222 is prevented from moving forward during the feeding of the first five holders by the jaws 235 by means of a pair of pivoted clamping jaws 261, which as the slide 236 begins its forward movement move inward to engage the sixth holder. The clamping jaws 261 remain in their clamping position during the forward and return movement of the slide, and are preferably thrown into holding position by means of adjustable lugs 263 carried by the slide in position to engage the jaws 261 and move them into holding position as the slide makes its forward movement and to hold them in such position during the forward and return movements of the slide, the jaws being properly formed to engage with said lugs during such movements of the slide. When the slide returns to its normal position, the lugs 263 release the jaws 261 and the latter are then returned to their non-operative position, as shown in Fig. 4, by means of springs 263^a.

The counting and feeding mechanism, as above described and as shown in the drawings, is substantially the same as that shown and described in my said application No. 125,419, except the holding jaws 261, after the lugs 263 have moved out of engagement therewith on the return movement of the slide 236, are moved outward to their non-operative position by means independent of the slide, that is, by the springs 263^a. This change permits the extent of movement of the slide to be adjusted without affecting the movement of the holding jaws 261 to their non-operative position.

For advancing the row of nested holders to the channel 222 and through said channel to bring the first five holders of the row into position to be engaged by the feeding jaws 235, there is provided in accordance with the present invention an intermittently acting and preferably positively gripping and acting feeding means and a non-positive or slip feeding means for feeding the row of holders to said intermittent and positive feeding means. For this purpose there is preferably provided an endless flexible band or belt 600 mounted on pulleys 601 and 602 in position to bring the upper run of the belt in line with the channel 222, and a second endless belt or band 620 mounted on pulleys 621 and 622 in position to bring the upper run of this belt in line with the upper run of the belt 600. The feeding belt 600 is arranged to grip the row of nested holders after leaving the pulley 601 and to release the holders before reaching the pulley 602, and this gripping of the row of holders by the feeding belt is of such character as to provide substantially a positive feeding of the holders; and the feeding belt is moved intermittently to feed the row of holders between each feeding movement of the feeding jaws 235 a distance sufficient to bring the fifth holder of the row into position to be engaged by the jaws 235 on their next forward movement. The movement of the feeding belt between each feeding movement of the feeding jaws is preferably such as to advance the row of holders a distance slightly greater than the average distance necessary to bring the fifth holder of the row into position to be engaged by the feeding jaws. Such over movement of the row of holders will be taken up by a slight compression or further nesting of the row of holders between the feeding belt and the holding jaws 238, and will practically insure the fifth holder of the row being always in position for engagement by the feeding jaws 235.

The feeding belt 600 is preferably formed of an endless flexible band provided in its face with a continuous longitudinal groove adapted to receive the row of nested holders and of such size that when the sides of the belt stand in the position shown in Fig. 5, the sides of the groove will grip the holders with sufficient force to insure the row of holders moving with the belt. The belt is preferably formed so that in cross-section it will normally be of the form shown in Fig. 5, and the pulleys 601 and 602 are provided with

convex peripheries, or crowned, as shown, so that as the belt passes about the pulleys it will be transversely flexed to open the groove as shown in Figs. 4 and 6. The belt may be formed of rubber or any suitable flexible material. It will be seen that as the belt comes up about the pulley 601, its groove will be opened so as to permit the row of nested holders to enter readily therein, as shown in Figs. 4 and 6, and that after leaving the pulley 601 the belt will resume its normal form as shown in Fig. 5, the sides of the groove closing against and gripping the row of holders, and that as the belt runs on to the pulley 602 it is again flexed transversely to open the groove thereby releasing the row of holders and permitting the holders to leave the belt as it turns about the pulley 602, the holders being advanced in the line of the upper run of the belt into and through the channel 222. A support 603 is preferably provided to prevent sagging of the upper run of the belt 600; and in order to insure the desired gripping of the holders by the belt, side guides 604 are preferably provided on the support to hold the sides of the belt in position to secure such desired gripping action.

For giving the belt 600 an intermittent movement, either of its supporting pulleys may be rotated intermittently by suitable driving means. As shown, the pulley 602 is rotated intermittently by means of an oscillating lever 605 connected by a rod 606 with the oscillating member of a suitable one-way clutch 607. The lever 605 is shown as oscillated against the tension of a spring 608 connected to the oscillating member of the clutch, by means of a cam 609 on the cam shaft 20. An adjustable connection, as indicated at 610, is preferably provided between the oscillating member of the clutch and the rod 606 to provide for changing and adjusting the length of the intermittent movements of the belt 600. The belt pulley 601 is preferably carried by an adjustable block 611 to provide for adjustment of the pulley toward and from the pulley 602.

A support 623 is provided for the upper run of the feeding belt 620, and guides 624 are provided extending over the upper run of said belt to guide the row of nested holders lying on the belt and spaced apart so as to permit the row of holders to rest on the belt and move easily between them, this belt thus forming a non-positive feeding means for advancing the row of nested holders to the positive and intermittent feeding means formed by the belt 600. The belt 620 is preferably driven intermittently in time with the movements of the belt 600 and is given a faster movement than the belt 600. As shown, the belt 620 is given its intermittent movement by means of a driving belt 625 running on a pulley 626 on the shaft of the pulley 602, and a pulley 627 on the shaft of the pulley 622, the pulleys 626 and 627 being of such relative size that the belt 620 will be driven faster than the belt 600.

In operation the row of nested holders will extend over the feed belts 600 and 620 and at each movement of the bands the row will be advanced a distance sufficient to bring the first five holders of the row into the place of the five holders which were advanced from the end of the row on the previous movement of the feeding jaws 235. As the rear end of the row of holders is advanced over the belt 620, additional holders are placed on the belt 620 by the attendant and nested with the holders already on the belt. The slip feeding belt 620 acts, not only to support and feed the rear end of the row of holders to the positive feeding belt 600, but by reason of its moving faster than the belt 600 it acts as a nesting means for insuring the proper nesting of holders placed thereon by the attendant with the rear holders of the row, closing up any looseness in the nesting of the holders.

As the holders are usually supplied in short sticks or bunches of a number of nested holders, it will be seen that my improved feeding mechanism may be readily supplied with holders by an attendant even when operating to supply holders to the packing or other mechanism at very high speed.

It will be understood that the counting mechanism may be arranged to feed any desired number of holders at a time from the end of the row, the length of the intermittent movements of the feeding belt 600 being adjusted to correspond with the number of holders fed from the row at each movement of the counting mechanism.

It will be understood also, that the invention is not to be limited to the exact construction and arrangement of parts, as shown, but that it includes changes and modifications thereof within the claims.

What is claimed is.

1. The combination of feeding means for advancing a row of nested conical tubes longitudinally formed of an endless flexible band provided in its face with a continuous longitudinal groove adapted to receive the row of tubes and means for bending said band transversely to cause the groove to open to receive and discharge the row of tubes and to close to grip the tubes, means for feeding the row of tubes to said band, and means for supporting the row of tubes as it is advanced from the band, substantially as described.

2. The combination of feeding means for advancing a row of nested conical tubes longitudinally formed of an endless flexible band provided in its face with a continuous longitudinal groove adapted to receive the row of tubes and means for bending said band transversely to cause the groove to open to receive and discharge the row of tubes and to close to

grip the tubes, a feeding belt for feeding the row of tubes to said band, said feeding belt moving at a greater speed than said band, and means for supporting the row of tubes as it is advanced from the band, substantially as described.

3. The combination of feeding means for advancing a row of nested conical tubes longitudinally formed of an endless flexible band provided in its face with a continuous longitudinal groove adapted to receive the row of tubes and means for bending the band transversely to cause the groove to open to receive and discharge the row of tubes and to close to grip the tubes and means for driving said band intermittently, a feeding belt for feeding the row of tubes to said band, said feeding belt making a greater movement than said band and moving at a speed not less than the speed of movement of said band, and means for supporting the row of tubes as it is advanced from the band, substantially as described.

In testimony whereof, I have hereunto set my hand, in the presence of two subscribing witnesses.

BENJAMIN W. TUCKER.

Witnesses:

J. A. GRAVES,

A. L. KENT.