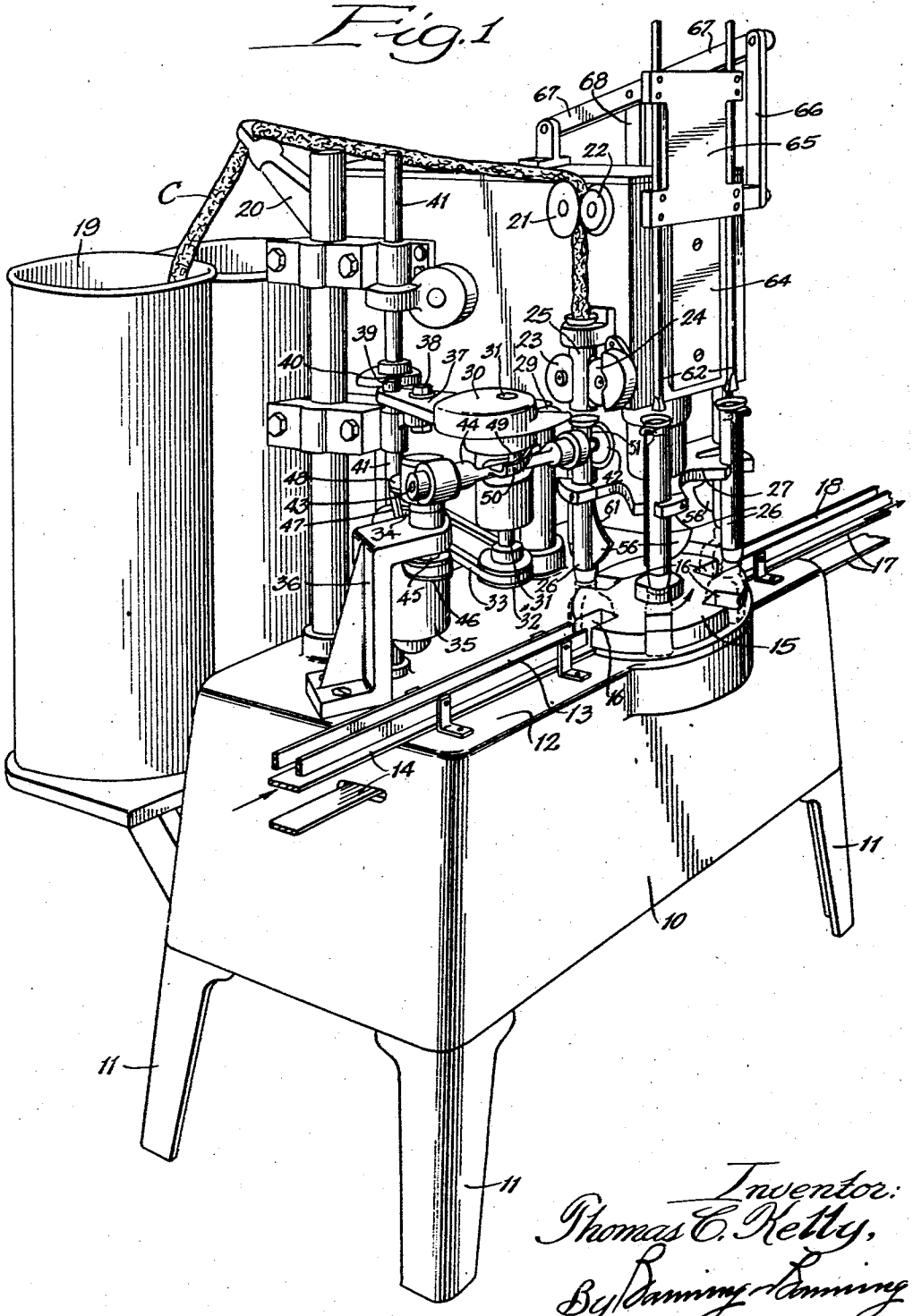
Dec. 3, 1946. T. C. KELLY 2,412,089

BOTTLE WADDING MACHINE AND METHOD

Filed Sept. 16, 1943 5 Sheets-Sheet 1

Fig. 1



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BOTTLE WADDING MACHINE AND METHOD

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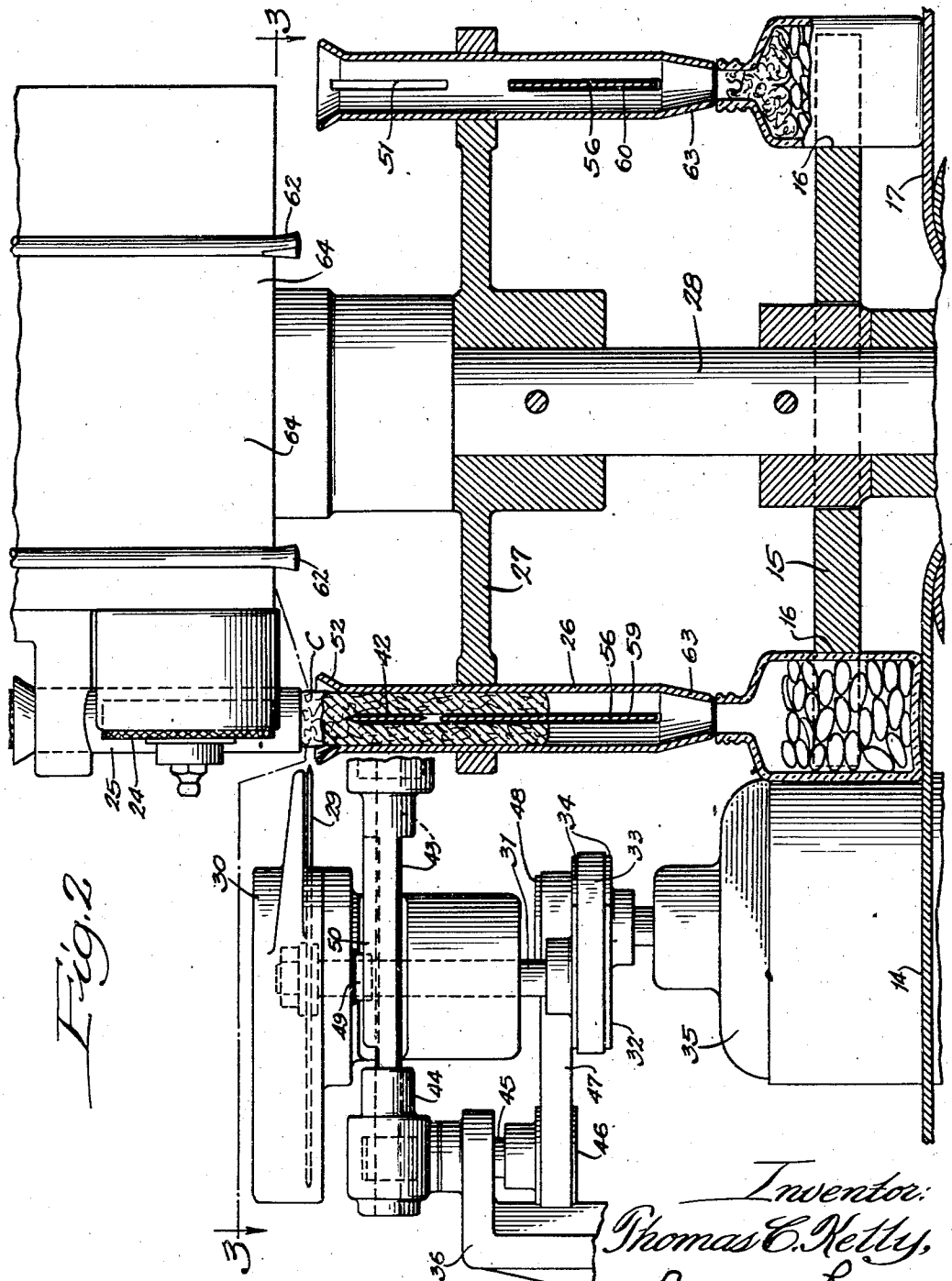


Fig. 2

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Dec. 3, 1946. T. C. KELLY 2,412,089

BOTTLE WADDING MACHINE AND METHOD

Filed Sept. 16, 1943 5 Sheets-Sheet 3

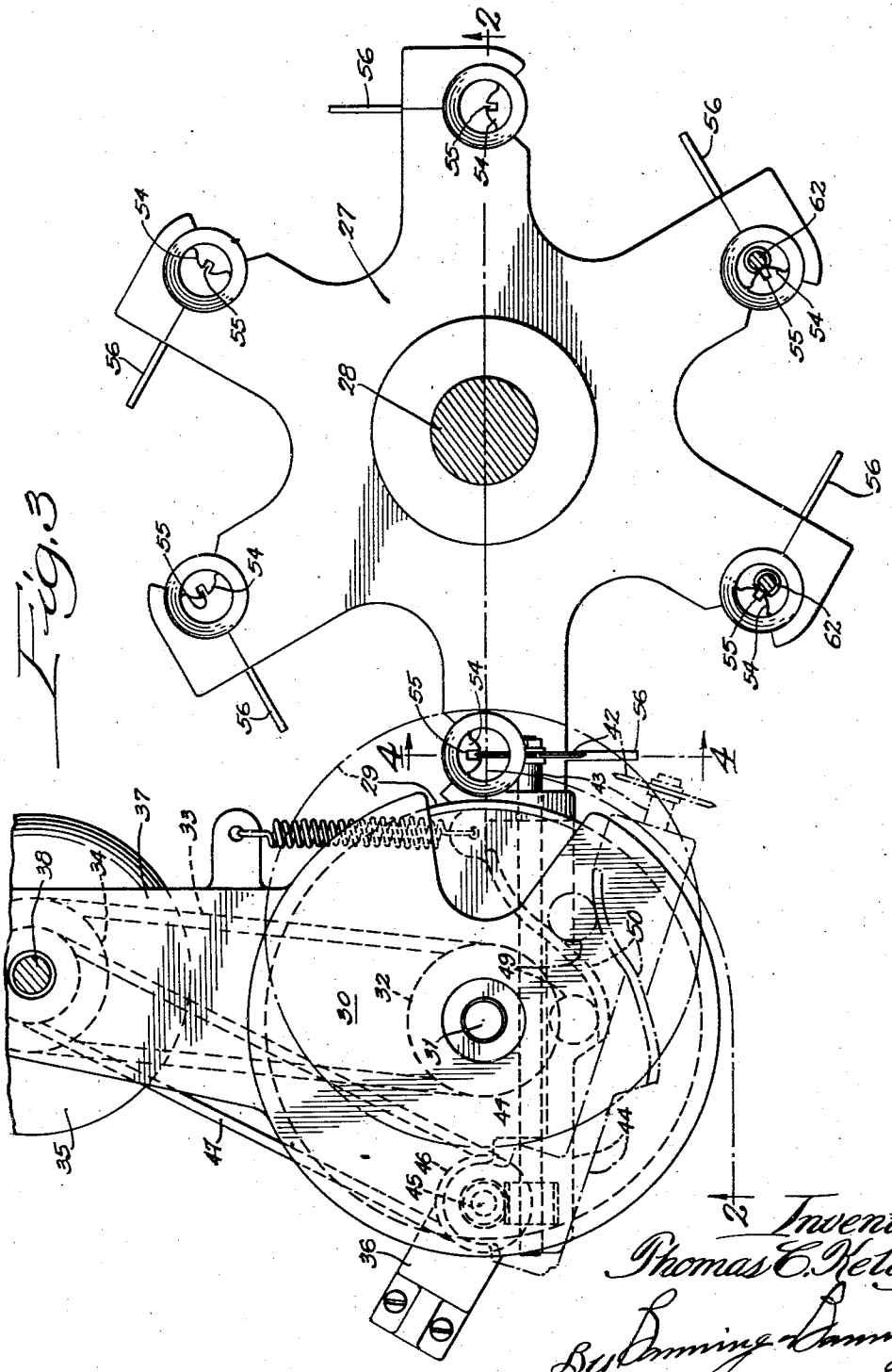


Fig. 3

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BOTTLE WADDING MACHINE AND METHOD

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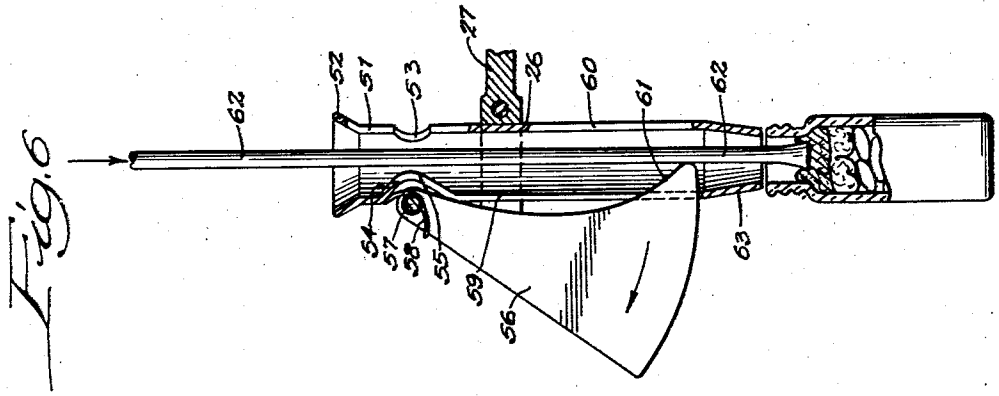


Fig. 6

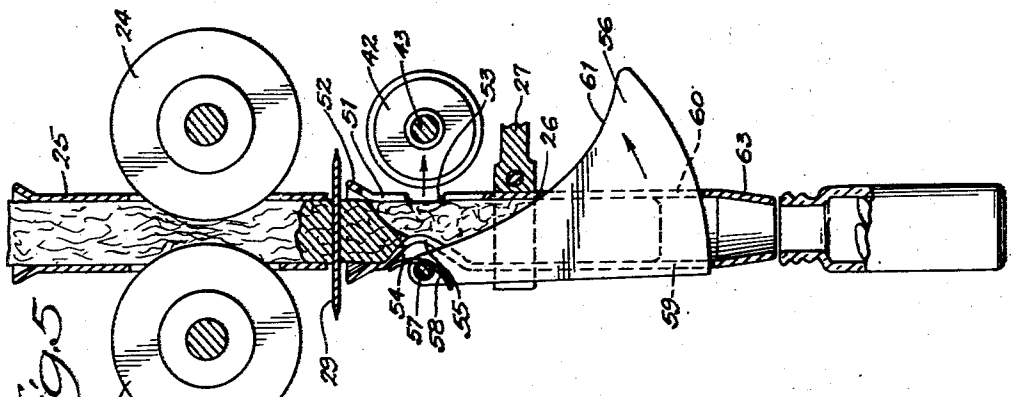


Fig. 5

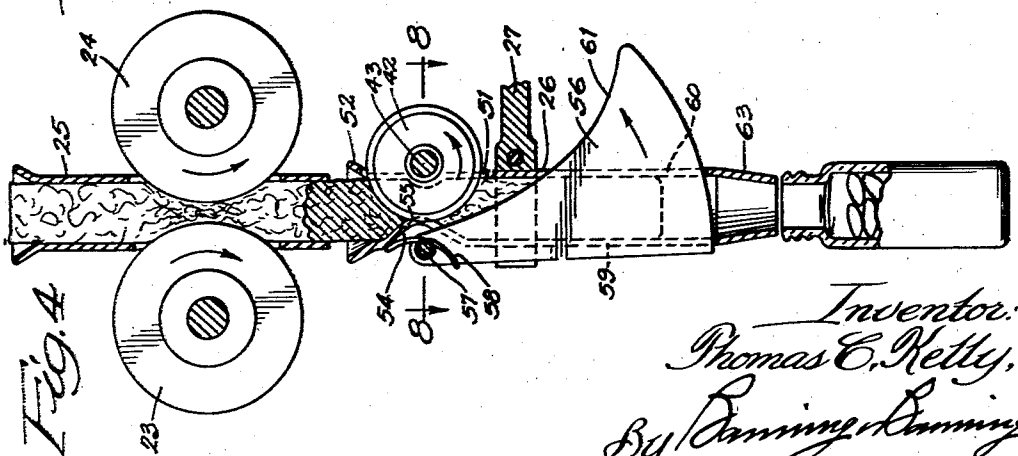


Fig. 4

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BOTTLE WADDING MACHINE AND METHOD

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Fig. 7

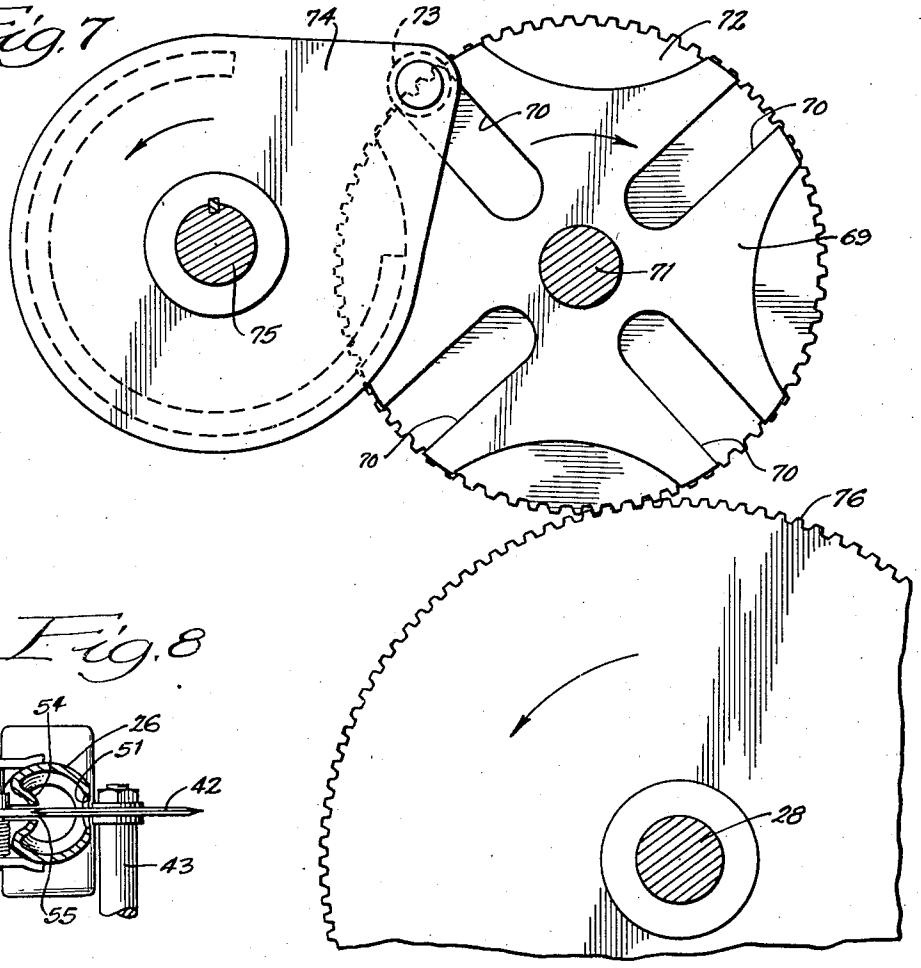


Fig. 8

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Patented Dec. 3, 1946

2,412,089

UNITED STATES PATENT OFFICE

2,412,089

BOTTLE WADDING MACHINE AND METHOD

Thomas C. Kelly, Hinsdale, Ill.

Application September 16, 1943, Serial No. 502,608

17 Claims. (Cl. 226—19)

1

The present invention is designed as an addition to the cotton wadding machine shown and described in Patent No. 2,171,572, issued September 5, 1939, although the special features of the present invention are capable of employment in other types of machines designed for a similar purpose. The cotton wadding machine of the patent above referred to is designed to feed forward a continuous rope or strand of fibrous material, preferably cotton, and to cut therefrom charges of suitable length for insertion into the mouth of a bottle or other container of the character commonly employed for the retention of tablets, pills, or other materials of a similar nature, and wherein it is desirable to wad the mouth of the bottle to prevent rattling or contamination of the contents.

The machine of the patent aforesaid has proven highly effective for use in the wadding of bottles which are not abruptly shouldered below the neck but in cases where the bottle is thus shouldered, it has been found desirable to modify the structure of the machine in such a way as to make provision for the lateral distention of the wadding beneath the shoulders of the bottle in order to more firmly compact the contents where bottles of this character are employed, and the present invention is designed as an addition or attachment for the purpose of thus spreading the wadding under the conditions named.

The method here involved consists broadly in the slitting of the leading end of a cotton wad prior to its insertion into a bottle and in guiding and directing the slitted end during the inserting operation, so that divided legs or sections of the wad will tend to spread laterally during the thrust which inserts the charge into the bottle thereby causing the wadding sections to spread beneath the bottle shoulders and thus more completely fill the empty space above the contents of the bottle.

In the machine here illustrated, as an exemplification of the present invention, the forward end of a continuous rope of cotton or the like is fed downwardly by rollers and forced into the end of a tube from which the charge is ultimately ejected into the bottle. During the infeeding of the cotton into the tube, the forward end of the charge is slit endwise by a cutter and at the same time the upper end of the charge is cut free from the continuous rope thus completing the insertion of a charge into the tube in preparation for its subsequent ejection into the bottle. Thereafter, while the tube is in register with the bottle mouth, the charge is subjected to the thrust of a plunger

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and to the action of a separator blade within the tube which serves to maintain the slitted ends of the cotton charge in separate relation during the bottle charging operation. These operations are all performed in a timed sequential series so that the bottles in processional relation will be brought to the charging point at the proper time to register with the loaded tube to receive the wad ejected therefrom.

Further objects and details will appear from a description of the invention in conjunction with the accompanying drawings, wherein—

Figure 1 is a perspective view of a machine which, save for the special features of the present invention, is substantially similar to that shown and described in full detail in the patent previously referred to;

Fig. 2 is a sectional elevation of the tube carrier and the slitting mechanism and associated parts which constitute the special subject matter of the present invention;

Fig. 3 is a detail in plan showing the tube carrier and the slitting mechanism and the means for actuating the same;

Figs. 4, 5 and 6 are sectional details illustrating three stages for the loading, slitting and discharging of a cotton wad;

Fig. 7 is a detail of the Geneva movement employed for intermittently advancing the carrier for the tubes into which the wadding charges are first loaded and from which are afterwards discharged; and

Fig. 8 is a cross sectional detail of one of the tubes with the associated slitting cutter taken on line 8—8 of Fig. 4.

Save for the special features presently to be described in full detail, the machine in the form shown is substantially the same as that fully described in the patent referred to, so that it is not here deemed necessary to describe in full detail the entire train of operating connections whereby power is transmitted to the various operating mechanisms. The machine as a whole comprises a base housing 10 supported upon legs 11 and presenting its upper surface in the form of a table top 12 which supports the externally located portions of the mechanism. The bottles to be wadded are fed inwardly through a guide track 13 which stands in elevated relation above the upper turn of endless conveyor belt 14 driven in any suitable manner. The inner end of the guide track 13 stands in adjacent relation to a carrier disk 15 which is rotated in counterclockwise direction by any suitable mechanism. The carrier disk is provided in its periphery with a

series of notches 16 which, in the present instance, are six in number and equally spaced, and each of proper dimensions to receive a bottle of the size to be wadded. The bottles are fed inwardly on the inner side on Fig. 1 and are released from the machine and carried onwardly after wadding by a conveyor belt 17 located in adjacent relation to guide track 18 similar, in all respects, to guide track 13.

The continuous strand of cotton C lies coiled within a container 19, and its leading end is carried through a guide arm 20 and thence between upper feed rolls 21 and 22 and lower feed rolls 23 and 24, similar in all respects to those shown in the patent aforesaid. The lower feed rolls project through the wall of a fixed tubular guide 25 which stands in position to successively register with each of a series of loading tubes 26 which, in the present case, are six in number, and clamped within and carried by the arms of a star wheel carrier 27 corresponding to the rotating head 36 of the patent, which star wheel is carried by and rotatable with a vertical shaft 28 corresponding to the shaft 37 of the patent.

The upper ends of the loading tubes 26 stand at an elevation which affords relatively close clearance for the intrusion of the razor sharp edge of a rapidly rotating cutter blade 29, the major portion of which is located within a housing 30, cut away on its inner side to expose the cutter blade and permit it to swing into the clearance space between the fixed guide tube 25 and a charging tube 26. The cutter blade is fixed upon a vertical shaft 31 which is journaled through the housing 30 and carries a grooved pulley 32 at its lower end. The pulley mounts a belt 33 driven by a pulley 34 on the shaft of a motor 35 supported from a bracket arm 36, or in any other suitable manner. The housing 30 is provided with an outwardly extending arm 37 which is mounted upon a fixedly positioned pivot 38, and the outer end of the arm 37 carries a roller 39 which is engaged by a cam 40 on a cam shaft 41 in reduced train with the motor, so that at recurrent intervals the high point on the cam will swing the cutting edge of the knife blade into the space through which the cotton strand is being fed for the purpose of severing a charge of cotton of the required length to constitute a charge. The pivotal mounting 38 is in concentric relation with the motor shaft so that the inswinging of the cutter will not disturb the belt driving relationship of the parts, the knife being driven at a very high rate of speed and maintained in razor-edged condition to cleanly cut through the cotton strand. The above described features are substantially identical with those described in the patent aforesaid, so that further description is deemed unnecessary.

The cross cutting blade coacts with a slitting rotary blade 42 which constitutes one of the principal features of the present invention. The slitting blade is mounted upon the inner end of a horizontal shaft 43 journaled through a swivelly mounted swinging bracket arm 44, which is in train with a vertical driving shaft 45 journaled through the bracket arm 36, and carrying a grooved pulley 46 at its lower end. The grooved pulley mounts a belt 47 which passes around a driving pulley 48 also on the motor shaft so that the operation of the motor will simultaneously impart a high speed of rotation both to the cross cutter blade and the slitting blade.

The housing 30, as shown, is provided with a depending stud 49 which registers with a cam track 50 so configured that as the housing swings inwardly to advance the cross cutting blade toward the cotton strand, the slitting blade will first be swung inwardly sufficiently to cause its cutting edge to pass through a vertical slot 51 in the proximate wall of the charging tube currently in register therewith, as best illustrated in Figs. 4, 5 and 6, thereby preliminarily slitting the leading portion of a cotton charge before the same is cut free from the cotton strand. The charging tubes of a single set are all of the same formation and of a size to coact with the bottles to be wadded, and it will be understood that sets of charging tubes of varying dimensions may be substituted for one another to fit bottles of different sizes as occasion may require.

In the form shown each charging tube is throated at its upper end 52 and the slot 51 is of sufficient width to provide the clearance necessary to permit the slitting blade to swing inwardly to a sufficient extent to slit through the advancing end of the cotton charge in order to divide the lower portion thereof into separated legs or sections without, however, slitting through the upper end of the charge which preferably remains intact.

In order to permit the employment of a relatively small slitting blade and to provide for its inswinging to the desired extent, the slot 51 is recessed laterally at the points 53 which permits the slitter shaft 43 to swing inwardly to the extent indicated in Fig. 4, and in order to more thoroughly compress the cotton toward the cutting edge, an inwardly projecting boss or hump 54 is provided in the opposite wall of the tube which is provided with a vertical slot 55 through its crest which permits the edge of the blade to enter slightly, and thereby insure a clean and complete cut through the cotton wad. It is necessary to time the inward swing of the slitting blade so that it will advance to cutting position while the cotton strand is being fed forwardly under the thrust of the feed rolls and before the cessation of this feeding movement occurs in preparation for the severing of a charge by the cross cutting blade, and the cam track 50 is configured to time these movements accordingly. Thus in Fig. 4 I have shown the slitter blade thrust inwardly to attack the leading end of the cotton strand while still under the feeding action of the rolls 23 and 24. In Fig. 5 I have illustrated the recession of the slitter blade in preparation for the advance of the edge of the cross cutter blade 29, which is shown in said figure, and it will there be noted that the upper end of the wad remains intact and in condition for its final insertion into the bottle after the loaded charging tube has been moved away from the slitting position and brought into register with the mouth of the bottle.

In order to hold the divided sections of the cotton wad in separated relation both before and during the bottle wadding operation, I have provided a separator blade 56 of thin metal, and preferably of segmental shape, which is pivoted at its tapered upper end upon a pintle 57 surrounded by a light spring 58 which normally maintains the separator blade in the inthrust position shown in Fig. 4, and wherein it traverses oppositely disposed slots 59 and 60 in the walls of the tube. The inner acting edge 61 of the separator blade is concavely rounded and during the advance of the botton strand, and the slitting thereof, the separator blade will occupy the inthrust position with its acting edge in line with

the edge of the blade, so that as the charge is being divided the sections or legs thereof will be separated. Fig. 5 shows the charge completely severed but with its ends held apart by the separator and in this condition, and with the tube standing in registry with the mouth of a bottle, the charge will be ejected by the down-thrust of a plunger 62 which forces the intact upper end of the charge past the edge of the separator blade, which will yield under light spring pressure to permit the uncut portion of the cotton charge to slip by.

The lower end 63 of the tube is preferably tapered somewhat which imposes a light friction against the outer faces of the separated cotton sections as the wad is being driven through the contracted end of the tube, and the friction thus developed tends slightly to retard the passage of the contracted outer face portions of the sections and to cause the same to curl or spread outwardly toward the shoulders of the bottle which is properly positioned to thus permit the separated and outwardly distended ends of the wad to be forced back under the shoulders. The flaring or distention of the separated ends of the wad thus occasioned is due to the fact that the wad, instead of being integral throughout is divided and thus capable of separating under the combined action of the separator blade and the curling back occasioned by the frictional contact of the cotton with the restricted discharge opening from the tube. It is thus unnecessary to provide mechanical spreader means which enter the mouth of the bottle and operate from within to spread the cotton during its insertion into the bottle. The employment of such a means introduces an unnecessary complication in the action of the machine, and its use is restricted to bottles having a neck sufficiently short and broad to permit the mechanical spreaders to enter thereinto.

In the case of the present invention the force employed for injecting the wad into the bottle is afforded entirely by the longitudinal thrust of the plunger operating under the conditions heretofore described. Although for most purposes it is desirable to limit the slitting of the cotton wad to the lower portion, and to maintain the upper end intact, it is not essential in all cases that this condition be maintained since the present method of introducing a divided wad from a tube into and through the mouth of a bottle is one which is applicable to completely divided cotton wads, or even to duplicate strands of cotton which are combined to form a divided charge when severed to the required length. Such a charge, whether divided within the machine itself or formed from the union of separately introduced strands, when subjected to a discharging or wadding action of the character here described, will tend to separate and flare outwardly under the thrust of a plunger and to back into the space below the shoulders of a bottle, so that in its broader aspects the invention is not confined to the use of special mechanism hereinbefore described for slitting and separating the wadding charges.

In the machine in the form shown, I have mounted six charging tubes on the arms of the star wheel carrier 27 which is fast upon the shaft 28, which also mounts the carrier disk 15 for the bottles. These parts operate in unison so that as a bottle is introduced into one of the notches 16 in the carrier disk, it will come into register with one of the charging tubes and will be intermittently advanced therewith, first to a position immediately below the plunger 62 which drives the cotton wad into the bottle, and thereafter in position to receive the thrust of a supplementary plunger 64 which it is desirable to employ in order to prevent the lodgment of any stray whisps of cotton around the mouth of the bottle which might later interfere with the bottle capping operation and to more effectively seat the wad down on the contents of the bottle. Both plungers operate in unison and are connected to a slidably mounted head plate 65 operated by a link 66 and a lever 67, which in turn is oscillated by a thrust bar 68 corresponding to the parts 83 and 87 of the patent aforesaid. The means for timing the reciprocation of the plungers are in all respects similar to those described in the patent, so that detailed description is here deemed unnecessary. In view of the fact that the carrier disk in the form shown is provided with six notches for receiving bottles, and of the further fact that six charging tubes are carried by the machine, each of which must momentarily stop to receive and sever a charge from the cotton strand while preceding tubes stand in register with the plungers during an interval of rest, provision is made for the rotation of the shaft 28 which mounts these parts by a step by step advance imparted by the Geneva movement, as shown in Fig. 7, which corresponds in function to the Geneva movement shown in Fig. 6 of the patent, or by other equivalent means.

The present Geneva movement includes a star wheel 69 provided with four radially disposed recesses 70 and fixed on a shaft 71 carrying a spur gear 72. Intermittent motion is imparted to the star wheel by a roller 73 carried by a plate 74 keyed on a constantly power driven shaft 75. The spur gear 72 meshes with a larger spur gear 76 on the shaft 28, the ratio being such that one rotation of the driving spur gear 72 will impart two-thirds of a rotation to the driven spur gear 76. The ratio thus provided insures that during a complete rotation of the carrier disk it will be stopped six times, so that three of the tubes will simultaneously stand in coacting relation with the charging and discharging mechanisms shown. That is to say, the most advanced tube of the group of three will be in position to receive the thrust of the supplemental plunger 64, while the second tube is receiving the discharging thrust of the plunger 62, and the first tube of the group is receiving a charge from the continuous strand.

It will be understood, however, that all of these mechanical details may be changed or modified without departing from the spirit of the invention, and that insofar as the bottle feeding features are concerned it is necessary only that the bottles stand in register with the tubes during the plunger operations since the tube charging operation need not be performed with a bottle in register.

Operation

The operation may be briefly described as follows: A continuous strand of cotton or equivalent wadding material is drawn forward from the receptacle 19 by the pull of power driven feed rollers 23 and 24, which serve to advance the leading end of the strand and thrust the same into the mouth of a tube which, during this interval, will stand stationary and in register with the feed rollers. After the desired length of wadding has been fed into the tube, the swiftly rotating cutter blade 29 will swing inwardly under the action of the cam 40. However, before the cross cutting blade severs the

strand the inswing of the casing **30** will advance the slitter blade **42**, the rapidly rotating edge of which will be projected inwardly through the slot **51** in the tube to slit the still advancing end of the strand before the cross cutting blade severs the charge therefrom. This sequence of operations is well illustrated in Figs. 4 and 5 from which it will be observed that the slitter blade has assumed its cutting position while the feed rollers **23** and **24** are still rotating, as indicated by the arrows. Fig. 5 indicates the position assumed by the parts at the instant the cross cutter blade reaches its severing position from which it will be noted, by the absence of arrows, that the rotation of the rollers has stopped and that the slitter blade has retreated to its outermost position. Fig. 5 illustrates the position of the parts at the conclusion of the charging operation, and immediately thereafter the Geneva movement will impart rotation to the star wheel tube carrier **27** and the bottle feeding carrier disk **15** to advance the loaded tube with the bottle in register to a position immediately below the first plunger **62**. Immediately thereafter the plunger will descend, as in Fig. 6, which forces down the charge toward and into the bottle. The separator blade **56** during the slitting and cross cutting operations, illustrated in Figs. 4 and 5, will occupy the inthrust position under the light tension of the spring **58**, but during the descent of the plunger **62** the separator blade will yield to permit the passage of the uncut upper end of the charge as the lower divided end is being forced into the bottle.

The reduced discharge end **63** of the tube will increase the friction against the outer faces of the divided wadding, and this will have the effect of retarding the advance of the outer faces as compared with the interior of the charge which causes the legs or divisions of the same to diverge under the thrust of the plunger, and this tendency to diverge will be augmented by the diversion of the separator blade, so that as the slit end of the wadding charge is projected into the bottle the separated ends, coming into contact with the contents of the bottle, will flow under the shoulders and fill the space in the upper part of the bottle.

I am aware of the fact that even without the separator blade, the frictional retarding of the outer faces of the slit wadding, when subjected to a thrust from behind, will tend to spread the legs or divisions of the wadding charge to a substantial degree which may be satisfactory in certain cases, although where a bottle is heavily shouldered it is desirable to provide some kind of a separator which will serve to prevent the inner faces of the slit wadding sections from contacting one another during a considerable portion of the discharging period, and I therefore consider the separator to be a desirable, although not indispensable, feature of the present invention. Furthermore, the presence of such a separator which is interposed between the divided sections of the wadding causes the inner surfaces to slip smoothly along the faces of the separator, so that the inner surfaces will be somewhat compacted by this action which reduces the tendency to intermesh after the leading end of the charge has entered the mouth of the bottle and escaped from further contact with the separator.

I am also aware that it may not be necessary in all cases to contract the discharge end of the charging tube since a tube of uniform diameter, receiving a charge of proper thickness, will

necessarily exert a certain amount of friction on the external surfaces with a resultant tendency to curl back or deflect, though for most purposes I have found that a terminal restriction with augmented friction at the point of discharge is most effective in imparting a deflecting or spreading action to the divided charge. It will be understood, however, that the increase in friction may be obtained by slightly roughening the inner surface of the tube rather than by contracting its diameter, and that development of such a frictional effect rather than the employment of specific means for attaining it is regarded as the feature of importance, insofar as concerns the method here involved.

I am also aware of the fact that although it is desirable in most cases to restrict the slitting of the charge and to leave the rear or head intact which facilitates easy removal of the charge from the bottle, nevertheless I have in mind the fact that the charge may, if desired, be slit and divided from end to end without substantial modification in the resultant action involved in introducing the charge into a bottle. Substantially the same result will attend the introduction of charges which are derived from separate strands individually fed to a point of convergence and introduced into the charging tube as a single charge and thereafter ejected in the manner heretofore described.

It will therefore be understood that numerous modifications in detail may be introduced and that the essence of the present invention consists in the employment of a charge which is divided or slitted at its forward end and ejected from behind while under the confinement of the surrounding tube and under conditions which will tend to cause the legs or divisions of the charge to separate and spread under the shoulders of a bottle or similar receptacle which renders unnecessary the use of special mechanism designed to be inthrust into the mouth of the bottle for the purpose of positively spreading the wadding. By the employment of a slit wadding subjected to an endwise thrust from the rear under the conditions here described, the use of such spreading devices, with attendant complications is avoided, the wadding operation is rendered more uniform and satisfactory, and limitations due to the shaping of the bottle mouth are avoided, since the present method is one which may be successfully employed in the introduction of wadding charges into bottle necks of varying length and in connection with bottles of varying shape and dimensions, and by the term shouldered bottle I intend to cover any form of container which is flared or enlarged below the neck or equivalent opening.

I claim:

1. The method of wadding shouldered bottles which consists in externally confining a wadding charge longitudinally divided at its entering end and in maintaining such confined charge in register with the mouth of a shouldered bottle, imparting to the charge thus confined a longitudinal impulsion to advance the charge divided end foremost into and through the mouth of the bottle and meanwhile subjecting the outer faces of the divided charge to external friction sufficient to retard the advance of said faces relatively to the interior of the charge thus causing the divided leading ends of the charge to spread apart and underflow the shoulders of the bottle.

2. The method of wadding shouldered bottles which consists in externally confining a wadding

charge longitudinally divided at its entering end and in maintaining such confined charge in register with the mouth of a shouldered bottle, imparting to the charge thus confined a longitudinal thrust from the rear to advance the charge into and through the mouth of the bottle, holding the divided sections of the charge in non-contacting relation during at least a portion of the period during which the charge is exterially confined and being advanced divided end foremost into the bottle, and meanwhile subjecting the outer faces of the divided charge to external friction sufficient to retard the advance of said faces relatively to the interior of the charge thus causing the divided leading ends of the charge to spread apart and underflow the shoulders of the bottle.

3. The method of wadding shouldered bottles which consists in externally confining a wadding charge longitudinally divided at its entering end and in maintaining such confined charge in register with the mouth of a shouldered bottle, imparting to the charge thus confined a longitudinal thrust from the rear to advance the charge divided end foremost into and through the mouth of the bottle and meanwhile subjecting the outer faces of the divided charge to increased confinement and correspondingly increased external friction sufficient to retard the advance of said faces relatively to the interior of the charge thus causing the divided leading ends of the charge to spread apart and underflow the shoulders of the bottle.

4. The method of wadding shouldered bottles which consists in externally confining a wadding charge longitudinally divided at its entering end and in maintaining such confined charge in register with the mouth of a shouldered bottle, imparting to the charge thus confined a longitudinal thrust from the rear to advance the charge divided end foremost into and through the mouth of the bottle, holding the divided sections of the charge in non-contacting relation during at least a portion of the period during which the charge is externally confined and being advanced into the bottle and meanwhile subjecting the outer faces of the divided charge to increased confinement and correspondingly increased external friction sufficient to retard the advance of said faces relatively to the interior of the charge thus causing the divided leading ends of the charge to spread apart and underflow the shoulders of the bottle.

5. The method of wadding shouldered bottles which consists in advancing the leading end of a continuous strand of wadding while subjected to external confinement, longitudinally slitting the advancing end of the strand while thus confined and severing the end thus slitted to constitute a charge and thereafter subjecting the slitted charge to a thrust from the rear and to external friction to spread apart the slitted charge and cause the same to underflow the shoulders of a bottle as the charge is thrust into the same.

6. The method of wadding shouldered bottles which consists in advancing the leading end of a continuous strand of wadding while subjected to external confinement, longitudinally slitting the advancing end of the strand while thus confined and severing the end thus slitted to constitute a charge, and thereafter subjecting the slitted charge while still externally confined to a thrust from the rear to advance the same into a bottle and in holding the divided ends of the

charge in non-contacting, separated relation during at least a portion of such period of advancement, and in subjecting the outer faces of the divided charge to external friction sufficient to retard the advance of said faces relatively to the interior of the charge thus causing the divided leading ends to spread apart and underflow the shoulders of the bottle.

7. In a wadding machine for shouldered bottles, the combination of a charging tube, means for introducing a length of wadding material into the tube, means for longitudinally slitting the leading end of said length of material to constitute a divided charge, a holder for bottles adapted to position a bottle in aligned relation with the charging tube, and plunger means adapted to impart a thrust upon the charge while so positioned to force the charge with its divided end foremost out of the charging tube and into the bottle, the tube being so configured as to subject the exterior faces of the divided charge to sufficient friction to retard the advance of said faces relatively to the interior of the charge and thereby cause the divided ends to spread and underflow the shoulders of the bottle, and driving means and connections for actuating the operating parts in timed relationship.

8. In a wadding machine for shouldered bottles, the combination of a charging tube, means for introducing a length of wadding material into the tube, means for longitudinally slitting the leading end of said length of material to constitute a divided charge, said slitting means being positioned to cut through the end of the material while advancing within the tube, a holder for bottles adapted to position a bottle in aligned relation with the charging tube, and plunger means adapted to impart a thrust upon the charge while so positioned to force the charge with its divided end foremost out of the charging tube and into the bottle, the tube being so constructed as to subject the exterior faces of the divided charge to sufficient friction to retard the advance of said faces relatively to the interior of the charge and thereby cause the divided ends to spread and underflow the shoulders of the bottle, and driving means and connections for actuating the operating parts in timed relationship.

9. In a wadding machine for shouldered bottles, the combination of a charging tube, means for introducing a length of wadding material into the tube, means for longitudinally slitting the leading end of said length of material to constitute a divided charge, a holder for bottles adapted to position a bottle in aligned relation with the charging tube, and plunger means adapted to impart a thrust upon the charge while so positioned to force the charge with its divided end foremost out of the charging tube and into the bottle, the tube being so constructed as to subject the exterior faces of the divided charge to sufficient friction to retard the advance of said faces relatively to the interior of the charge and thereby cause the divided ends to spread and underflow the shoulders of the bottle, driving means and connections for actuating the operating parts in timed relationship, and separator means adapted to hold apart the divided ends of the charge during at least a portion of the period during which the charge is being thrust into the bottle.

10. In a wadding machine for shouldered bottles, the combination of a charging tube, means for introducing a length of wadding material into

the tube, means for longitudinally slitting the leading end of said length of material to constitute a divided charge, said slitting means being positioned to cut through the end of the material while advancing within the tube, a holder for bottles adapted to position a bottle in aligned relation with the charging tube, and plunger means adapted to impart a thrust upon the charge while so positioned to force the charge with its divided end foremost out of the charging tube and into the bottle, the tube being so constructed as to subject the exterior faces of the divided charge to sufficient friction to retard the advance of said faces relatively to the interior of the charge and thereby cause the divided ends to spread and underflow the shoulders of the bottle, driving means and connections for actuating the operating parts in timed relationship, and separator means adapted to hold apart the divided ends of the charge during at least a portion of the period during which the charge is being thrust into the bottle.

11. In a wadding machine for shouldered bottles, the combination of a charging tube, means for introducing a length of wadding material into the tube, means for longitudinally slitting the leading end of said length of material to constitute a divided charge, a holder for bottles adapted to position a bottle in aligned relation with the charging tube, and plunger means adapted to impart a thrust upon the charge while so positioned to force the charge with its divided end foremost out of the charging tube and into the bottle, the tube being so constructed as to subject the exterior faces of the divided charge to sufficient friction to retard the advance of said faces relatively to the interior of the charge and thereby cause the divided ends to spread and underflow the shoulders of the bottle, driving means and connections for actuating the operating parts in timed relationship, and a separator blade extending lengthwise within the charging tube and presenting its acting edge in register with the slit in the leading end of the charge and mounted to yield under pressure of the advancing charge and adapted to hold apart the divided ends of the charge during at least a portion of the period during which the charge is being thrust into the bottle.

12. In a wadding machine for shouldered bottles, the combination of a charging tube, means for introducing a length of wadding material into the tube, means for longitudinally slitting the leading end of said length of material to constitute a divided charge, said slitting means being positioned to cut through the end of the material while advancing within the tube, a holder for bottles adapted to position a bottle in aligned relation with the charging tube, and plunger means adapted to impart a thrust upon the charge while so positioned to force the charge with its divided end foremost out of the charging tube and into the bottle, the tube being so constructed as to subject the exterior faces of the divided charge to sufficient friction to retard the advance of said faces relatively to the interior of the charge and thereby cause the divided ends to spread and underflow the shoulders of the bottle, driving means and connections for actuating the operating parts in timed relationship, and a separator blade extending lengthwise within the charging tube and presenting its acting edge in register with the slit in the leading end of the charge and mounted to yield under pressure of the advancing charge and adapted to hold apart the divided ends of the charge during at least a portion of the period during which the charge is being thrust into the bottle.

13. In a wadding machine for shouldered bottles, the combination of a charging tube, means for feeding forward a continuous strand of wadding material and projecting its leading end into the charging tube, a slitting wheel and means for recurrently advancing its cutting edge into the interior of the tube to longitudinally slit the leading end of the wadding strand, a cross cutter and means for recurrently advancing its cutting edge across the strand to sever a charge therefrom while confined within the tube, a holder for shouldered bottles, plunger means adapted by a thrust from the rear to eject a charge from the tube, actuating means for first attaining registry of the tube with the strand feeding means and with the slitting wheel and cross cutter and thereafter with the plunger means while the tube is in registry with the mouth of a shouldered bottle, the tube being so constructed as to subject the exterior faces of the divided charge to sufficient friction to retard the advance of said faces relatively to the interior of the charge and thereby cause the divided ends to spread and underflow the shoulders of the bottle, and driving means and connections for actuating the operating parts in timed relationship.

14. In a wadding machine for shouldered bottles, the combination of a charging tube, means for feeding forward a continuous strand of wadding material and projecting its leading end into the charging tube, a slitting wheel and means for recurrently advancing its cutting edge into the interior of the tube to longitudinally slit the leading end of the wadding strand, a cross cutter and means for recurrently advancing its cutting edge across the strand to sever a charge therefrom while confined within the tube, a holder for shouldered bottles, plunger means adapted by a thrust from the rear to eject a charge from the tube, actuating means for first attaining registry of the tube with the strand feeding means and with the slitting wheel and cross cutter and thereafter with the plunger means while the tube is in registry with the mouth of a shouldered bottle, the tube being so constructed as to subject the exterior faces of the divided charge to sufficient friction to retard the advance of said faces relatively to the interior of the charge and thereby cause the divided ends to spread and underflow the shoulders of the bottle, driving means and connections for actuating the operating parts in timed relationship, and a separator blade extending lengthwise within the charging tube and presenting its acting edge in register with the slit in the leading end of the charge and mounted to yield under pressure of the advancing charge and adapted to hold apart the divided ends of the charge during at least a portion of the period during which the charge is being thrust into the bottle.

15. In a wadding machine for shouldered bottles, the combination of a charging tube, means for feeding forward a continuous strand of wadding material and projecting its leading end into the charging tube, a slitting wheel and means for recurrently advancing its cutting edge into the interior of the tube to longitudinally slit the leading end of the wadding strand, the tube being restricted on its interior at a point opposing the slitting wheel to compress the strand against its advancing edge, a cross cutter and means for recurrently advancing its cutting edge across the

strand to sever a charge therefrom while confined within the tube, a holder for shouldered bottles, plunger means adapted by a thrust from the rear to eject a charge from the tube, actuating means for first attaining registry of the tube with the strand feeding means and with the slitting wheel and cross cutter and thereafter with the plunger means while the tube is in registry with the mouth of a shouldered bottle, the tube being so constructed as to subject the exterior faces of the divided charge to sufficient friction to retard the advance of said faces relatively to the interior of the charge and thereby cause the divided ends to spread and underflow the shoulders of the bottle, and driving means and connections for actuating the operating parts in timed relationship.

16. In a wadding machine for shouldered bottles, the combination of a charging tube, means for feeding forward a continuous strand of wadding material and projecting its leading end into the charging tube, a slitting wheel and means for recurrently advancing its cutting edge into the interior of the tube to longitudinally slit the leading end of the wadding, the tube being restricted on its interior at a point opposing the slitting wheel to compress the strand against its advancing edge, a cross cutter and means for recurrently advancing its cutting edge across the strand to sever a charge therefrom while confined within the tube, a holder for shouldered bottles, plunger means adapted by a thrust from the rear to eject a charge from the tube, actuating means for first attaining registry of the tube with the strand feeding means and with the slitting wheel and cross cutter and thereafter with the plunger means while the tube is in registry with

the mouth of a shouldered bottle, the tube being so constructed as to subject the exterior faces of the divided charge to sufficient friction to retard the advance of said faces relatively to the interior of the charge and thereby cause the divided ends to spread and underflow the shoulders of the bottle, driving means and connections for actuating the operating parts in timed relationship, and a separator blade extending lengthwise within the charging tube and presenting its acting edge in register with the slit in the leading end of the charge and mounted to yield under pressure of the advancing charge and adapted to hold apart the divided ends of the charge during at least a portion of the period during which the charge is being thrust into the bottle.

17. In a wadding machine for shouldered bottles, the combination of a charging tube, plunger means adapted by a thrust from the rear to advance a wadding charge through the tube and to thrust the same into a shouldered bottle in registry with the tube, means located in the path of the wadding charge for longitudinally slitting the advancing end of the same, said tube being so constructed as to subject the exterior faces of the divided charge to sufficient friction to retard the advance of said faces relative to the interior of the charge and thereby cause the divided ends of the charge to spread and underflow the shoulders of the bottle and separator means extending inwardly from the tube wall in position to hold apart the divided ends of the charge during at least a portion of the period during which the charge is being thrust into the bottle.

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