

Oct. 19, 1943.

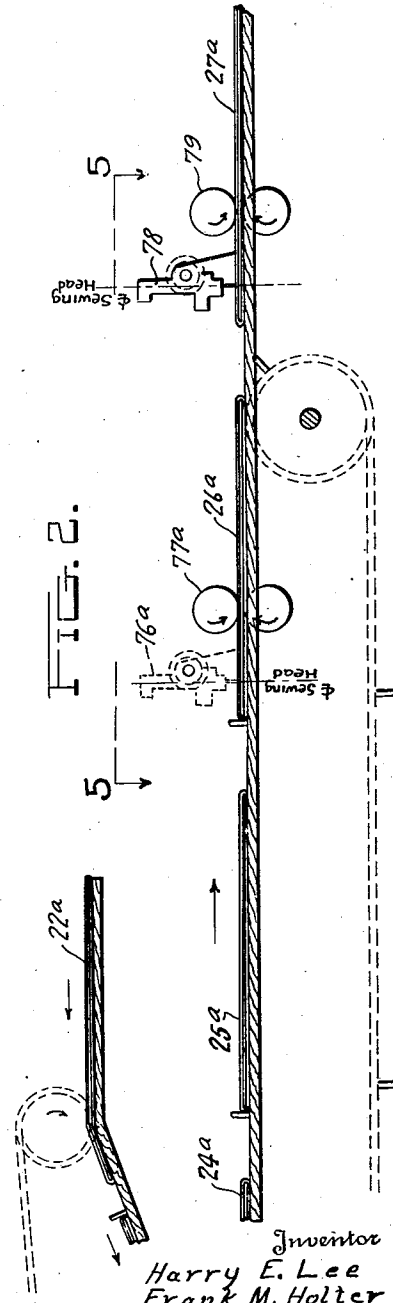
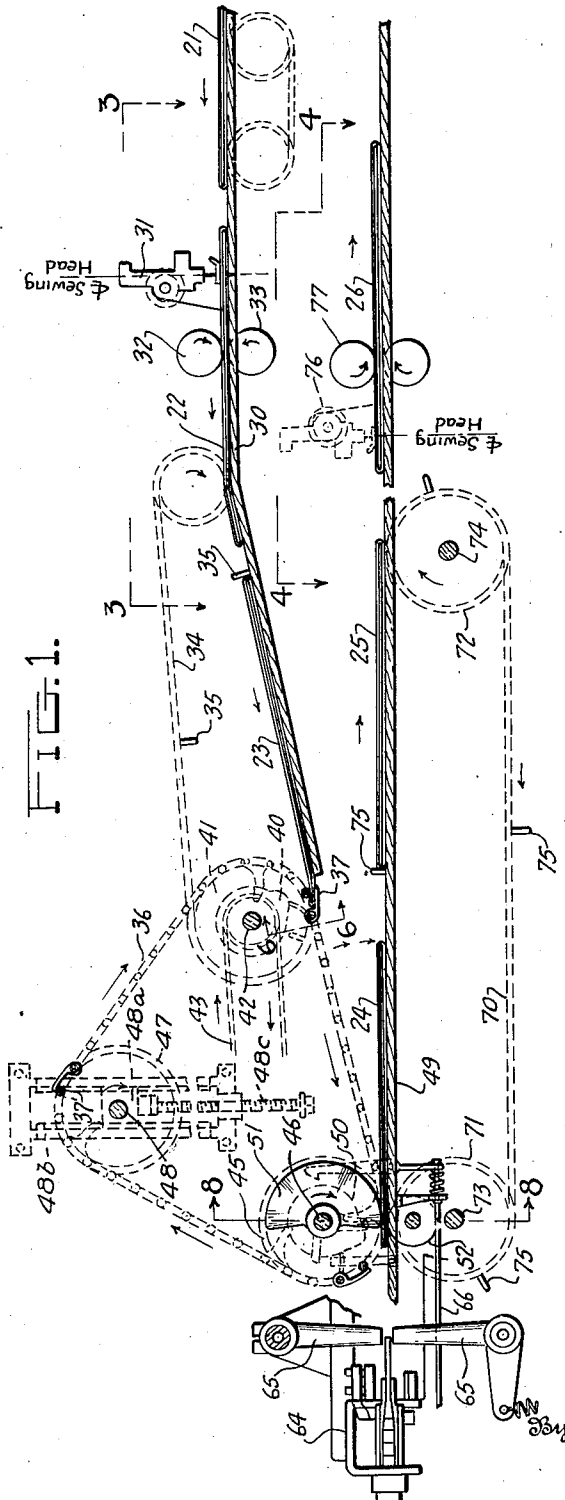
H. E. LEE ET AL

2,332,324

METHOD AND APPARATUS FOR FOLDING VALVES IN THE CORNERS OF
BAGS AND CLOSING THE ENDS OF THE BAGS BY SEWED SEAMS

Filed March 6, 1940

3 Sheets-Sheet 1



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FIG. 5.

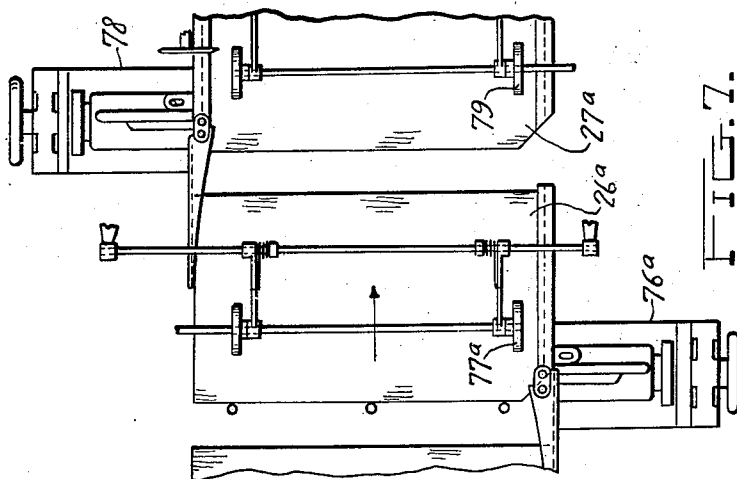


FIG. 7.

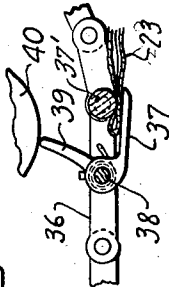


FIG. 4.

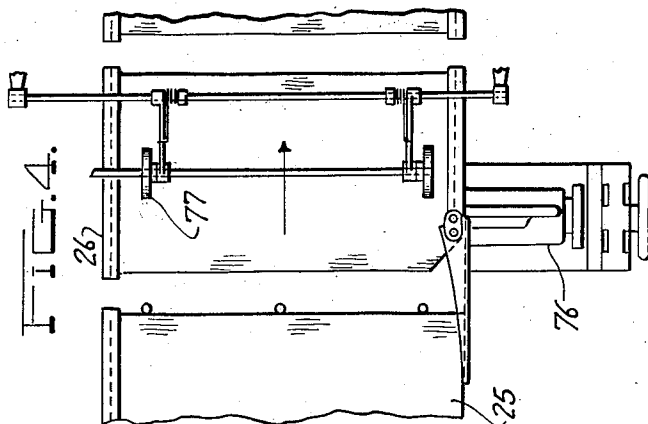


FIG. 6.

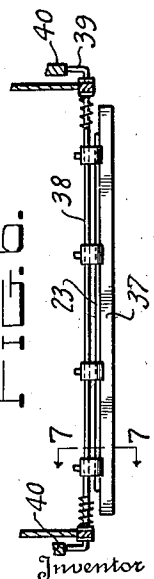
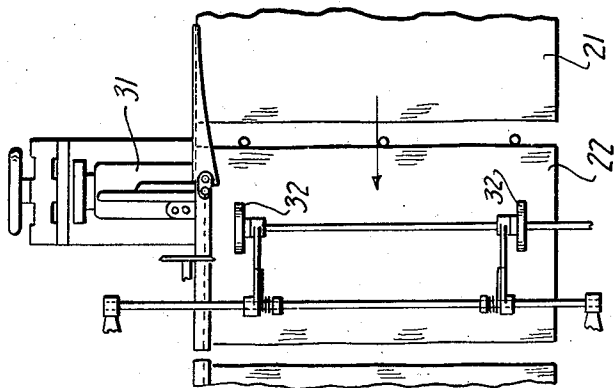


FIG. 3.



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FIG. 8.

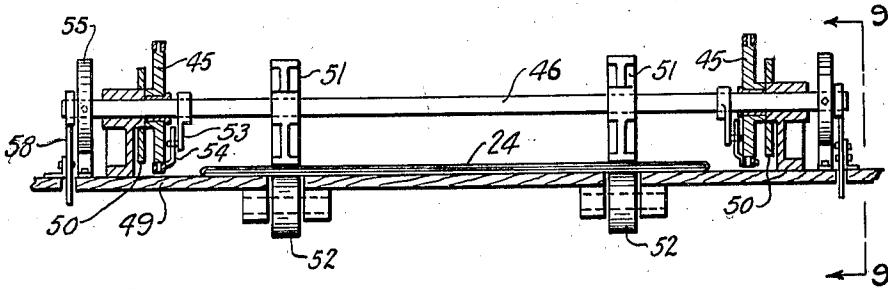


FIG. 9.

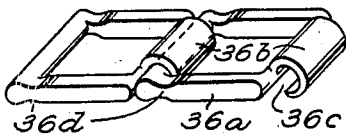
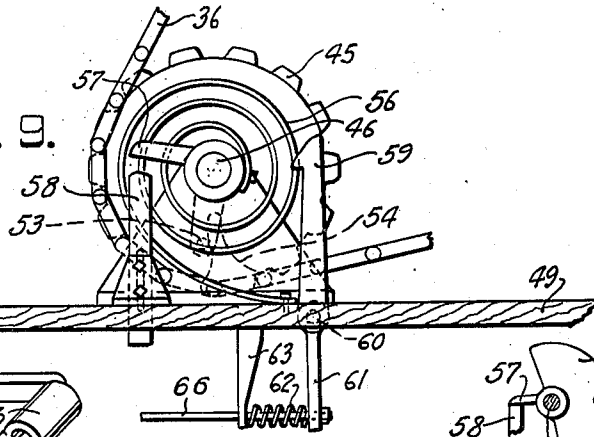


FIG. 13.

FIG. 10.

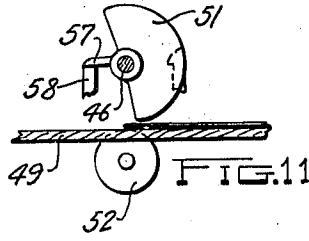
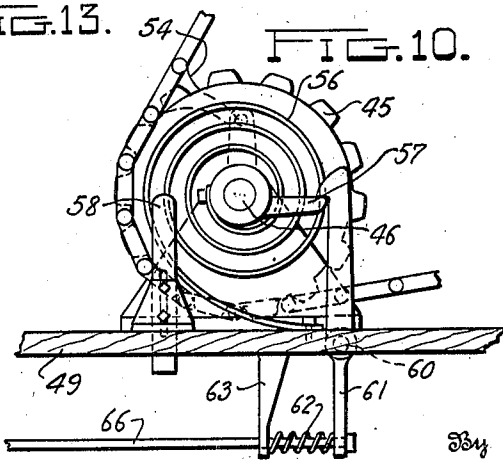


FIG. 11

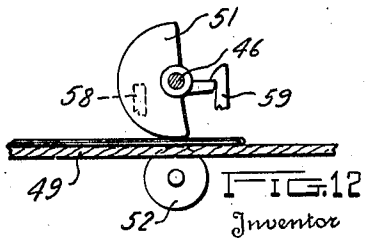


FIG. 12

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2,332,324

METHOD AND APPARATUS FOR FOLDING VALVES IN THE CORNERS OF BAGS AND CLOSING THE ENDS OF THE BAGS BY SEWED SEAMS

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Application March 6, 1940, Serial No. 322,448

12 Claims. (Cl. 112-10)

This invention relates to a method and apparatus for folding valves in the corners of bags and closing the ends of the bags by sewed seams.

An object of the invention is to provide means which will close the ends of a bag tube and fold a valve in one corner of each tube expeditiously and accurately with a minimum of manual handling of the bag.

A further object of the invention is to provide means of the kind described which can be readily adjusted to operate upon bags of different sizes.

Other objects and details of the invention will appear as the description proceeds.

In the accompanying drawings forming a part of this application,

Figure 1 is a somewhat diagrammatic longitudinal vertical section of one embodiment of the invention;

Fig. 2 is a partial section corresponding to the right end of Fig. 1, but showing a different arrangement of the sewing machines;

Fig. 3 is a partial plan view approximately on the line 3-3 of Fig. 1;

Fig. 4 is a partial plan view approximately on the line 4-4 of Fig. 1;

Fig. 5 is a partial plan view approximately on the line 5-5 of Fig. 2;

Fig. 6 is a detail view of a bag clamping device approximately upon the line 6-6 of Fig. 1;

Fig. 7 is a detail view of operating means for the bag clamp shown in Fig. 6 on the line 7-7 of Fig. 6;

Fig. 8 is a view of bag forwarding means substantially on the line 8-8 of Fig. 1;

Fig. 9 is an enlarged end view of the apparatus shown in Fig. 8 substantially on the line 9-9 of Fig. 8;

Fig. 10 is a view similar to Fig. 9, but showing the parts in a different position;

Figs. 11 and 12 are diagrammatic detail views of a bag forwarding segment in two successive positions.

Fig. 13 shows details of one form of sprocket chain which may be used.

In the embodiment of the invention shown in Fig. 1, there are disclosed a succession of bags designated by reference numbers 21 to 26, inclusive, these bags moving through the apparatus in the direction indicated by the associated arrows. The bags are first dropped upon a table 30 and are fed by any suitable means to a sewing machine indicated diagrammatically at 31, which sewing machine closes the end of the bag which is not to be valved.

From the sewing machine the bag is forwarded by any suitable means, such as indicated by rollers 32 and 33, to a feeding device which may comprise chains 34 which carry pushers 35, the chains being mounted and driven in any suitable way. By this means the bags are slid in succession along the preferably downwardly inclined discharge end of table 30. Chains 36 to carry clamps 37, one of which is in position to seize the forward edge of the bag as it is discharged from table 30. Clamps 37 are mounted upon a rod 38. (See Figs. 6 and 7 for details.) The rod 38 carries a crank arm 39 which encounters cam 40 so that the clamp is opened to receive the bag in the position indicated in Fig. 1 and is immediately thereafter closed by passing beyond the cam 40, movable members 37 clamping the bag against a rod 37' mounted on the chain. The chains 36 may be of any convenient kind which allows the ready removal or insertion of links, Fig. 13 illustrating one well known form when each link 36^a is provided with a hook 36^b which has a gap 36^c between its end and the adjacent end of the link just wide enough to slide over the grooved portion 36^d of the side member of the adjacent link when the links are in the proper angular relation to each other.

Chains 36 pass around sprocket wheels 41 on shaft 42 to bring clamps 37 into proper receiving position. Shaft 42 may be driven by any suitable means, a chain 43 being indicated. From sprockets 41, chains 36 move to sprockets 45 which may be mounted loosely upon a shaft 46. The chains then pass upward to sprockets 47 mounted upon shaft 48 which is preferably vertically adjustable by any suitable means. On the drawings there is indicated a bearing 48^a for shaft 48 which may be raised or lowered in a slideway 48^b by means of a screw 48^c. A table 49 underlies sprockets 45 and extends horizontally in both ways therefrom.

A cam 50 is mounted in position to contact arm 39 just as the clamps start upward from their lowest position beneath sprockets 45, thereby releasing the forward edge of the bags at this point.

As most clearly indicated in Fig. 8, shaft 46 carries forwarding segments 51 which are adapted to press the bag downward against rollers 52 therebeneath. A lug 53 is carried on each end of the shaft adjacent the sprocket wheels and lugs 54 on the chain contact lug 53 slightly before the forward edge of the bag is released by clamp 37. By the contact of these lugs shaft 46 and

segments 51 are oscillated so as to move the bag rapidly to the left as viewed in Fig. 1.

At each end of shaft 46 there is a spring 56 resisting the movement of the shaft in the direction in which it is driven by lugs 54 and tending to drive it in the opposite direction. The movement in this opposite direction is limited by lugs 57 which project from the shaft and contact adjustable stops 58 when the shaft is at rest in the receiving position. When oscillated by lugs 54, lug 57 is moved until it encounters and slips beneath the notch in latch 59 pivoted at 60 in table 49. Latch 59 has an extension 61 beneath the table which is normally pressed to the right as viewed in Fig. 9 by spring 62 between extension 61 and a stationary bracket 63 mounted on table 49.

In this way the segments are oscillated to move the bag into position with respect to the valving apparatus which is designated by reference number 64 on Fig. 1. The particular construction of the valver mechanism is no part of the present invention, suitable valvers being known in the prior art. Some means for spreading the gusset, usually present in bags of this type, may be employed. In the form shown vacuum tubes 65 are indicated which may operate in accordance with similar disclosure in Hartman Patent No. 1,723,164.

The valving operation is timed with the feeding means in a suitable manner. This might be done, if desired, by means of a rod 66 connected with extension 61 from latch 59 so that, when the latch is moved by lug 57, the operation of the valve may be initiated. Upon the completion of the valving operation, rod 66 may be moved again to release latch 59, whereupon springs 56 will drive the segments 51 through the reverse movement and shoot the bag back to the position in which bag 24 is shown in Fig. 1.

Suitable means is provided for feeding bags to the right, as viewed in Fig. 1, along table 49. In the construction shown, this is indicated as being chains 70 mounted upon sprockets 71 and 72 on shafts 73 and 74. The chains are provided with pushers 75 which may encounter and push the bags as they are delivered from the valver.

After the bags have been valved and delivered as described above, they may be fed to a sewing machine indicated diagrammatically at 76, from which they are discharged by any suitable means, rollers 77 being indicated for this purpose on Figs. 1 and 4.

By the arrangement just described, a right hand sewing head may be employed for sewing the bottom of the bag before the top is valved, and then another right hand sewing machine may be employed for sewing the top of the bag after valving, since the bag moves in opposite directions before and after valving. Most sewing machines are manufactured as right hand sewing machines, and by the construction indicated the readily available right hand sewing machines may be employed for sewing each end of the bag, as indicated in Figs. 1 and 4.

If preferred, both ends of the bag may be sewed after the valving operation. An arrangement whereby this may be done is indicated in Figs. 2 and 5. In accordance with this modification sewing head 76^a corresponds to the sewing head 76 shown in Figs. 1 and 4, but instead of employing sewing head 31 to sew the other end of the bag before valving, there is shown a left hand sewing head 78 which may be employed to sew the bottom of the bag after it has been

valved. Where such a left hand sewing head is employed, it may be located in any desirable relation to the head 76^a, that is, both ends of the bag may be sewed at the same time or the bottom may be sewed before the top as well as performing the sewing in the order indicated in Figs. 2 and 5.

The operation of the apparatus has been indicated in connection with the description of the various parts, but for convenience the cycle of operations will be repeated.

Bag tubes are fed in any suitable way from a source of supply to the position indicated for bag 21 in Fig. 1. They are then passed through sewing machine 31 which is at the right end of the bag when facing the direction of movement of the bag. From the sewing machine the bags proceed to the left, sliding down the sloping lower end of table 30 with slight assistance from pushers 35. The pushers 35 and clamps 37 are spaced relatively so that the forward edge of the bag is seized by the clamp immediately below the lower edge of table 30. The bag is then positively moved by the clamp to approximately the position indicated for bag 24. However, just before reaching this position the clamp is released, and by reason of lugs 53 and 54, shaft 46 begins to oscillate so that segments 51 drive the bag into position on the valver. Valving mechanism is started, by rod 66 or otherwise, just as the bag reaches proper position so that a valve is folded in the corner of the unsewed end of the bag in a well known manner. Upon the completion of the valving, the latch 59 is operated to release segments 51 and lug 57. Whereupon springs 56 oscillate shaft 46 and shoot the bag back to the right, away from the valving operation, and pushers 75 move the bag on to the right in time to make way for the leading edge of the next bag. It will be readily understood that no harm will be done if the rear edge of the bag moving to the left should fall upon pushers 75 before they have moved to the right the full width of the bag, since these pushers will continue to slide underneath the upper bag and push the valved bag to the right. The bag is then delivered to sewing machine 76 which sews the valve end of the bag, that sewing machine also being at the right end of the bag when looking in the direction in which the bag is moving during this sewing operation.

As previously indicated there is some advantage in the arrangement discussed which allows the employment of two right hand sewing machines. However, if preferred, a left hand sewing machine may be employed, as indicated in Figs. 2 and 5.

While it is usually more convenient to feed the bag to the apparatus in the upper plane and discharge the bag in a lower plane, since this leaves the upper plane free for feeding operations, it will be readily understood that substantially the same effect might be obtained by feeding the bag by means of clamps which move it slantingly upward and then discharging in a horizontal plane, although in that case the edge of the bag which follows in its movement into the valver would not drop into the discharging plane by gravity, but would have to be positively moved into the discharging plane. It will also be readily understood that while it is believed more convenient to feed the bag slantingly downward into the valving position and then horizontally, some of the objects of the invention could be accomplished with apparatus which fed the bag

horizontally into the valving position and then allowed it to be discharged in a downwardly slanting direction.

It will be readily seen that the apparatus disclosed may be adjusted to operate upon bags of different widths and lengths, adjustment as to length being taken care of by adjustment of the machine for sewing the bottom of the bag, in any convenient manner. Considerable variation in widths of bags may be taken care of by proper control of the sewing machines with respect to the operation of the bag-feeding apparatus. When changes in widths of bags are extreme, or when it is desired to adjust the feeding apparatus instead of, or in addition to, the control of the sewing heads, the feeding apparatus may be adjusted for narrower or wider bags by decreasing or increasing the distance between successive pushers on chains 34 and 70 and between successive clamps on chains 36. Tightener sprockets 47 are indicated for chains 36, so that adjustment may be made by movement of the tightener corresponding to removal or insertion of links between clamps. Similar tighteners may be provided for chains 34 and 70, if desired.

While some possible alternative constructions have been indicated, this does not exclude other possible changes in the apparatus within the scope of the appended claims.

What we claim is:

1. The method of closing and valving bags which comprises moving a bag tube sidewise in a horizontal plane and sewing a closed seam through the right end of the tube when facing the direction in which the bag is moving, continuing the approximately horizontal movement of the bag into valving apparatus, tucking in one corner to form a valve in the open end of the bag, reversing the approximately horizontal movement of the bag and during said reversed movement sewing the valved end of the bag.

2. A method in accordance with claim 1 and wherein the bag is fed during a portion of its movement towards the valver in a downward slanting direction, and the following edge of the bag moving towards the valver is allowed to drag over the following edge of the valved bag which is moving away from the valver.

3. Apparatus comprising a valver, means to move a bag in an approximately horizontal path towards the valver, a sewing machine arranged to sew a seam, across the end of the bag which is not to be valved, during the movement of the bag towards the valver, means to reverse the approximately horizontal movement of the bag after valving, and a sewing machine arranged to sew the valved end of the bag as it moves away from the valver.

4. Apparatus in accordance with claim 3 and in which the means to move the bag towards the valver moves the bag in a slantingly downward direction during a portion of its path while the means to move the bag away from the valver is timed to move a valved bag below said downwardly slanting path while the unvalved bag is being moved in said path.

5. Apparatus in accordance with claim 3 and the means for moving the bag to the valver comprising chains and clamps on the chains adapted to clamp the leading edge of the bag and drag it towards the valver.

6. Apparatus in accordance with claim 3 and the means for feeding the bag to the valver com-

prising chains, clamps on the chains adapted to grip the leading end of a bag and drag it towards the valver and an adjustable tightener for the chains whereby the distance between successive clamps may be adjusted by insertion or removal of links between the clamps and corresponding movement of the tightener.

7. Apparatus for valving bags comprising means to feed bags in one path towards the tucking mechanism and leave the bags adjacent thereto, and means for moving the bags from said adjacent position to tucking position and back to said adjacent position, and other means for moving the bags away from said adjacent position, the means for moving the bags away from tucking position comprising spring actuated means and a trip operated by a rod from the tucking device to release the spring for operative movement.

8. Apparatus in accordance with claim 7 and in which the means to move the bag to said adjacent position comprises chains with clamps thereon adapted to seize the leading edges of bags and drag them towards said adjacent position.

9. Apparatus in accordance with claim 7 and in which the means to move the bags to said adjacent position comprises chains, clamps on the chains adapted to seize the leading edges of successive bags and drag them towards said adjacent position, and a tightener for the chains whereby the distance between successive clamps may be adjusted by insertion or removal of links between the clamps with corresponding adjustment of the tightener.

10. In apparatus for valving bags, a valve tucker, means to feed a bag to operative position with the tucker, resilient means tensed by the said feeding of the bag, a latch holding said resilient means tensed during the tucking operation, means to release said latch when the tucking is completed, and connections to said resilient means driving the bag away from said operative position when the trip is released.

11. In apparatus for valving bags, a valve tucker, means to feed a bag from a position adjacent the tucker to operative position with the tucker, resilient means connected to said feeding means and tensed by the movement of said feeding means in moving a bag to operative position, a latch holding the resilient means in tensed position, and means for tripping the latch when the tucking operation is completed, the feeding means contacting the bag so that when the resilient means is released and returns the feeding means to its original position, the bag is shot swiftly away from the tucker.

12. Apparatus for valving bags comprising means for tucking in one corner of a bag tube to form a valve and means for feeding a bag tube to said tucking means, said feeding means comprising chains having removable links, clamps mounted on the chains and adapted to seize the leading edges of successive bag tubes and feed them towards the tucking apparatus, sprocket wheels at the ends of the run of the chains where the clamps are operative, and adjustable sprockets between said end sprockets and contacting the chains in their return run, whereby the length of the chains and the distance between clamps may be adjusted without changing the number of clamps on the chains.

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