Oct. 4, 1949. E. W. VREDENBURG 2,483,860

MACHINE FOR APPLICATION OF SLEEVES TO VALVE BAGS

Filed July 31, 1945 4 Sheets-Sheet 1

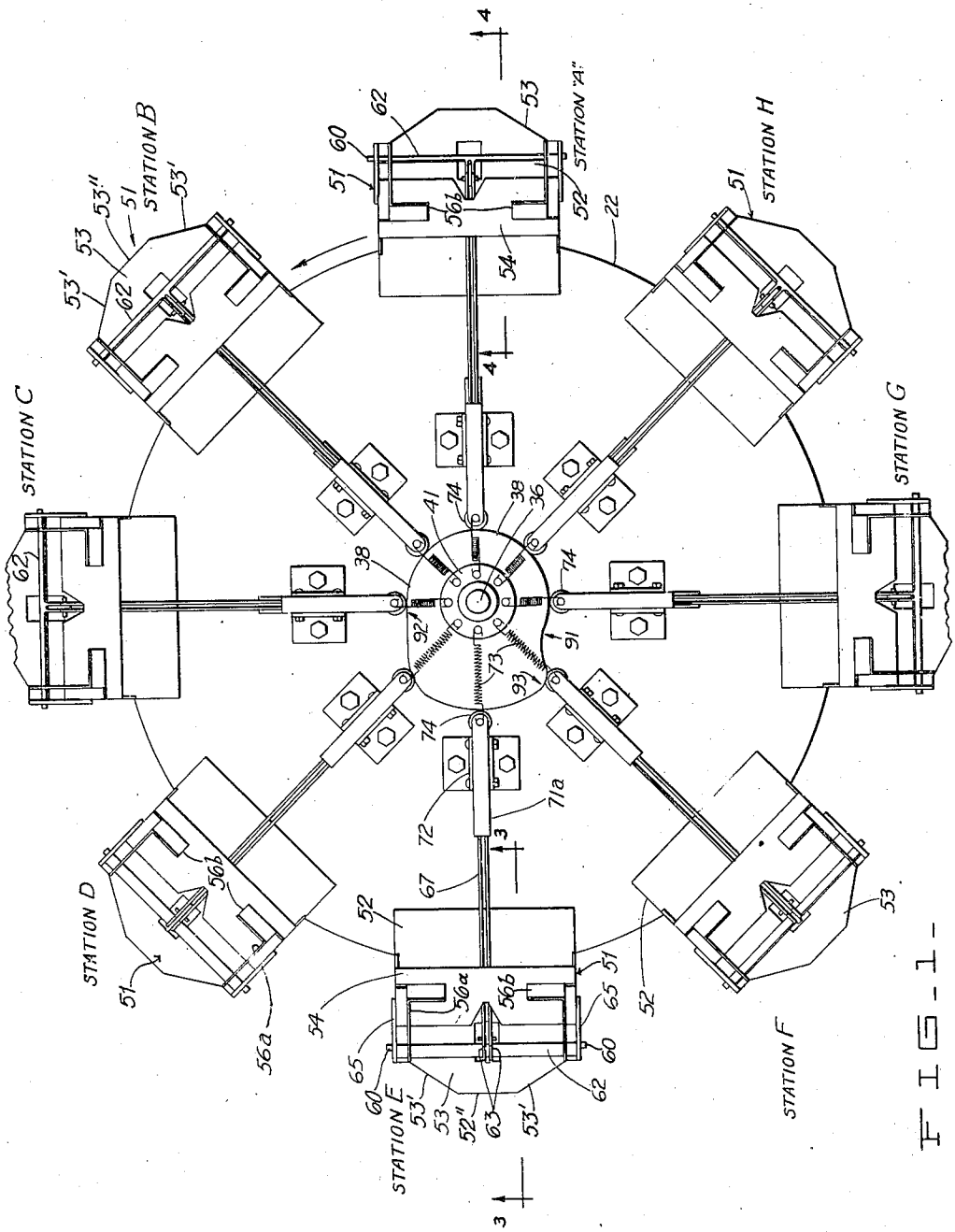


FIG-1-

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Filed July 31, 1945 4 Sheets-Sheet 2

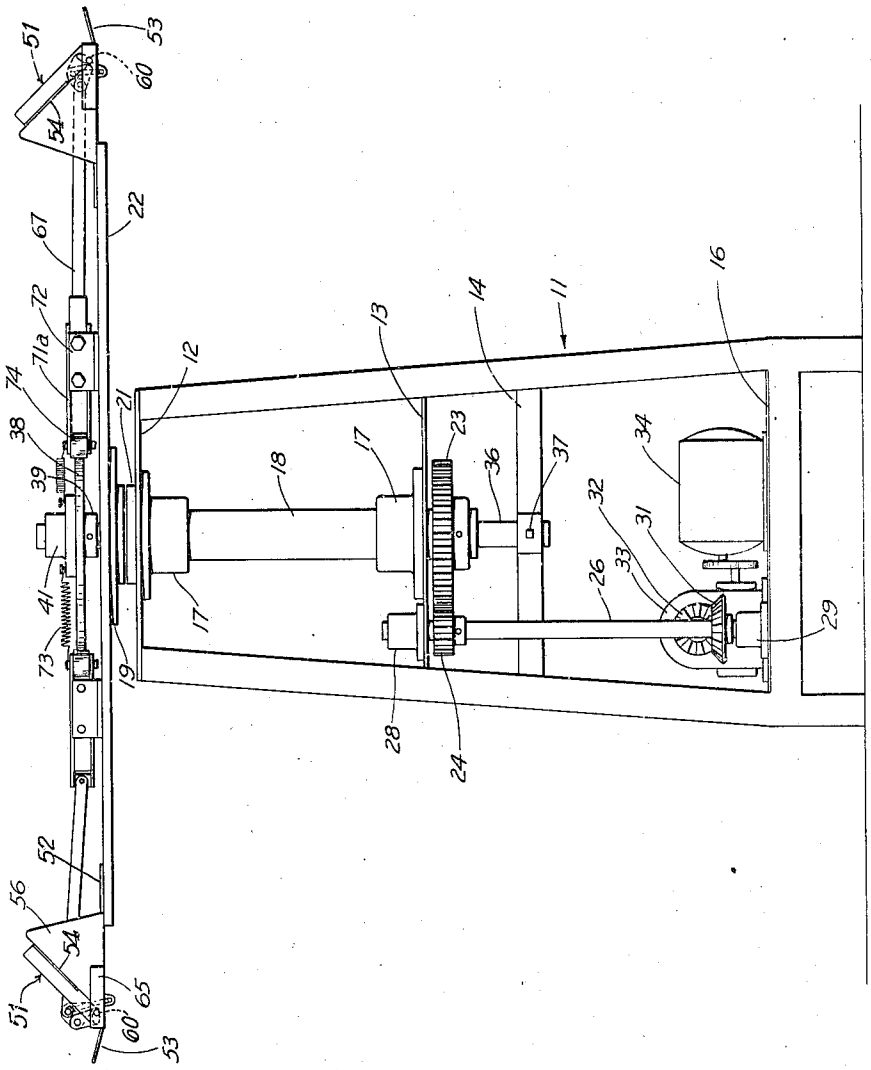


FIG-2-

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Filed July 31, 1945 4 Sheets-Sheet 3

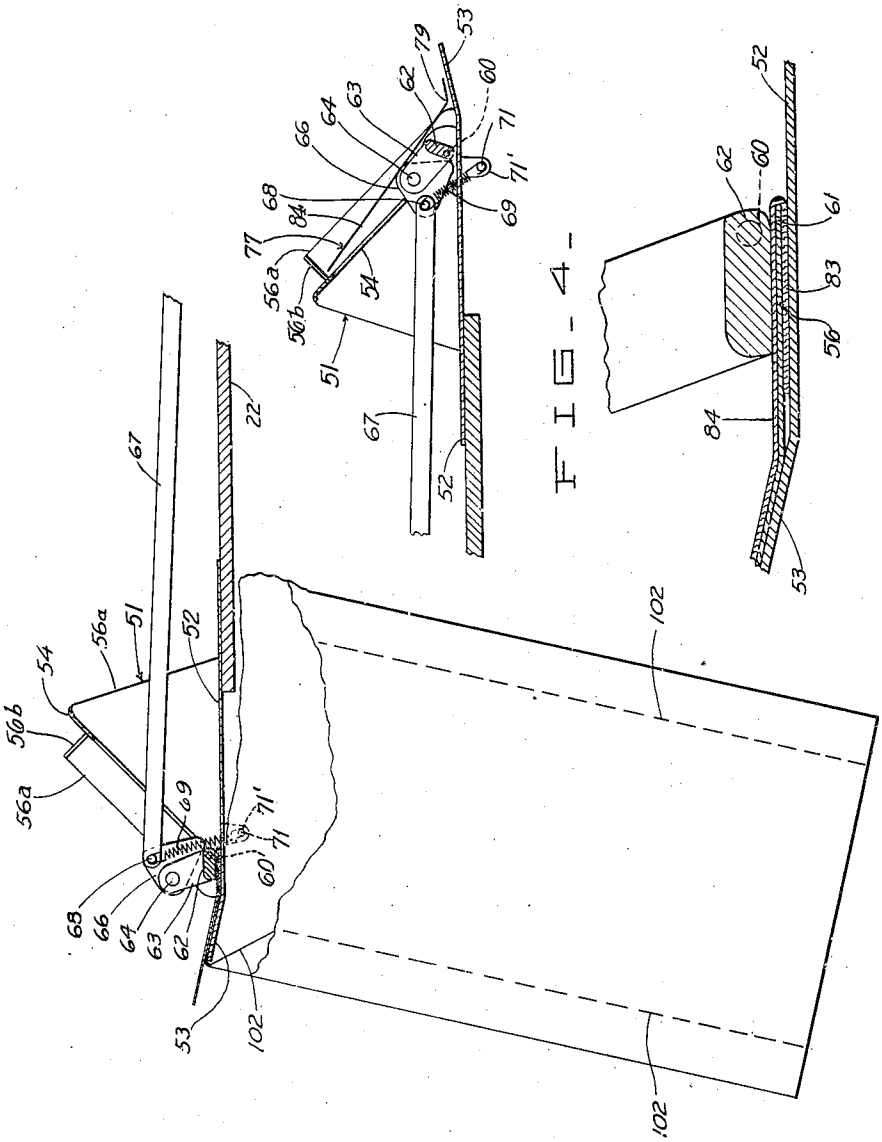


FIG-3-




FIG-4-

FIG-5-

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MACHINE FOR APPLICATION OF SLEEVES TO VALVE BAGS

Filed July 31, 1945 4 Sheets-Sheet 4

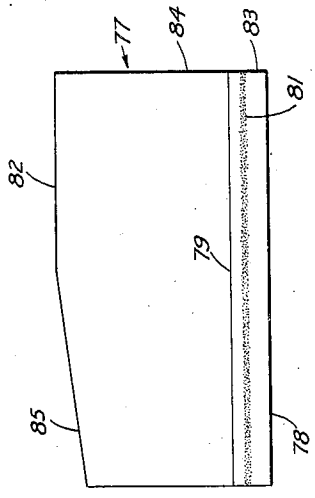


FIG-6-

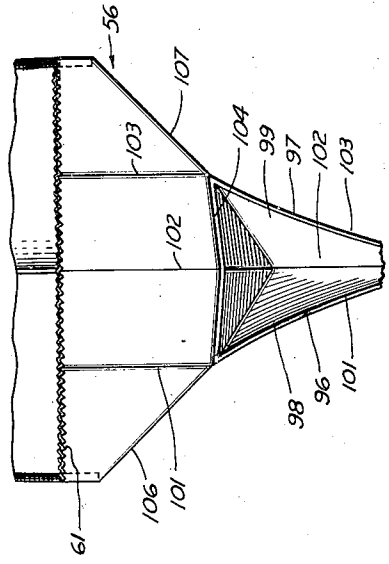


FIG-7-

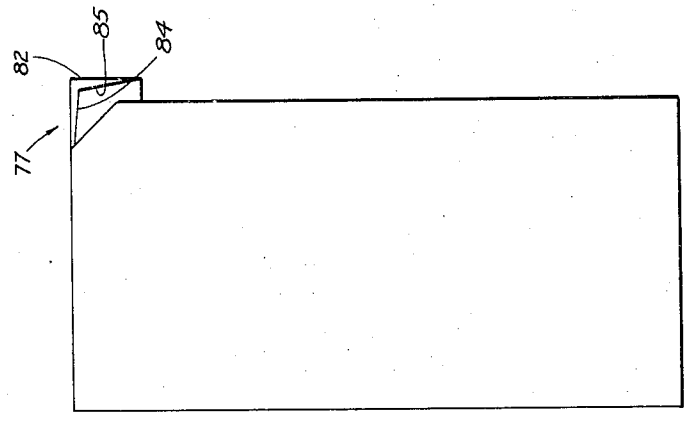


FIG-8-

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2,483,860

# UNITED STATES PATENT OFFICE

2,483,860

## MACHINE FOR APPLICATION OF SLEEVES TO VALVE BAGS

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5 Claims. (Cl. 93—8)

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This invention relates to improvements in the manufacture of bags, and particularly to improvements in apparatus for applying supplemental sheets to valved bags to form sleeves in the respective valves.

Bags of this general character are manufactured of kraft paper, or the like, several sheets of the material being fed simultaneously from a continuous supply to form a continuous multilayer tubular structure. This is suitably creased to form a gusset along each side of the bag, and cut into desired lengths to form bag blanks of predetermined size. One corner of each bag blank is then folded inwardly in a well-known way and creased to form a valve therein, and a supplemental sheet is applied in the valve to thereby form a sleeve through which a filling tube may be inserted. After the sleeving operation, the bag is closed in any well-known manner, for example, by sewing. The bag may then be filled and the sleeve tucked in upon itself to seal the bag contents.

Heretofore, the supplemental sheet has usually been inserted by hand, and such a hand operation represents a relatively slow and necessarily expensive portion of the manufacturing operation. The present invention is concerned with a relatively simple machine for applying and securing the supplemental sheet to reduce, simplify and facilitate the manual operations required, and to produce a sleeved valve bag in which the sleeve is accurately positioned.

Various further and more specific objects, features and advantages of the invention will appear from the description given below taken in connection with the accompanying drawings illustrating by way of example a preferred form of the invention. The invention consists in such novel features and combinations as may be shown and described in connection with the apparatus herein disclosed.

Referring to the drawings accompanying and forming a part hereof,

Fig. 1 is a plan view of the machine;

Fig. 2 is a side elevation with certain units of the mechanism omitted to illustrate details of the construction employed;

Fig. 3 is a section taken along the line 3—3 in Fig. 1;

Fig. 4 is a section taken along the line 4—4 in Fig. 1;

Fig. 5 is an enlarged fragmentary view illustrating the folding of the supplemental sheet by certain parts of the machine;

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Fig. 6 is a plan view of one of the supplemental sheets;

Fig. 7 is a view looking downwardly at an angle toward the valve portion of a bag, the gusset and valve portions being spread apart in position to receive a supplemental sheet; and

Fig. 8 is a side view of a bag with the sleeve in position.

The construction and operation of the principal parts of a present preferred embodiment of the nvention will first be summarized. The machine may comprise a constantly rotating table 22 having at spaced points about its periphery a plurality of mechanisms 51 which will hereinafter be referred to as "sleeving devices," these devices preferably being all of like construction and each having a generally horizontal and slightly upwardly inclined protruding plate portion 53 and a cooperating inclined back plate or support 54 extending upwardly and rearwardly from the plate portion 53.

The supplemental sheets as at 77 (Fig. 6) which are to form valve sleeves are prepared just prior to application to the machine by creasing as at 79 and by the application of a stripe of adhesive 81 thereto, as by any suitable known means or methods. That is, a stripe 81 of glue or other adhesive may be applied along near one edge of the sheet and the sheet is creased along and inwardly of such stripe in preparation for folding over a longitudinal band or strip 83 of the sheet, bearing the adhesive stripe.

The operator of the machine of the present invention takes the sheets thus prepared and places them respectively in the sleeving devices as these devices successively pass the operator's position, for example, at station A (Fig. 1). The main body portion 84 of each such sheet is placed in the sleeving device so as to rest against the inclined back plate or support 54 and with the line of creasing 79 resting upon or along close to the protruding plate portion 53 (see Fig. 4). And the strip or band 83 of the sheet which bears the stripe of adhesive 81 rests in an outwardly directed position upon said protruding plate portion and with the adhesive stripe facing upwardly. With the sheet thus in place, as the sleeving device moves past the next position or station, an operator slides the spread-out valve portions of a bag onto the protruding plate portion 53, which is so shaped as to hold the valve portion spread out as a substantially plane surface, as shown in Fig. 7. As the bag is thus positioned, the inner edge 61 of the valve portion comes into a position

to overlie the strip or band 83 on the sheet which bears the stripe of adhesive 81.

As the bag valve portions are thus thrust into position, the inner edge portions 61 of the valve come into engagement with the crease 79 in the supplemental sheet and thus tend to push the creased portion inwardly of the machine, with the result that the main body portion 84 of the sheet tends to fold over outwardly of the valve.

Then, as the sleeving device 51 moves to the next positions or stations C and/or D, mechanism is provided including a "folding bar" 62 (Figs. 3–5) for completing the operation of folding over the main body portion 84 of the sheet firmly into position overlying the plane spread-out valve portions of the bag as shown in Fig. 3. This folding bar may be operated by suitable cam and linkage arrangements hereinafter described, actuated by reason of the rotation of the table. As the table turns to bring the sleeving device to the next position or positions (stations E and F), the folding bar acts to clamp the creased folded-over sheet portions firmly in position astride the inner edge of the plane spread-out valve portions, thus giving the adhesive opportunity to set and secure the sheet in place, with its main body portion protruding outwardly of the valve portion of the bag and with the glued band of the sheet hooked or folded under the inner edge portions 61 of the bag valve. As the sleeving device reaches a subsequent position, for example station G, the mechanism operates to turn the folding bar out of its clamping position, thus leaving the bag with the attached supplemental sheet free to be removed from the machine by an operator, who may simultaneously bring the opposed bag walls together, thus creasing the supplemental sheet and attached valve along a center line 102 (Fig. 7) of the valve. If preferred, this final central creasing of the sheet (at right angles to the above-mentioned crease 79) may be accomplished by a finger protruding from the folding bar so as to form the crease simultaneously with the clamping of the sheet in position on the valve parts, but such automatic creasing is not necessary.

Referring now to the drawings in further detail, the machine may include a suitable frame structure, generally indicated by numeral 11, the height of the frame being such that the operating elements are at a convenient height for the operators. The frame includes a top plate 12, a first intermediate transverse plate 13, a second intermediate plate or frame part 14, and a bottom plate 16. Bearings 17, 17 are mounted upon plates 12 and 13, respectively, to support a hollow shaft 18 for rotation. The upper end of the hollow shaft carries a flanged thrust bearing member 19, which rides over a stationary thrust bearing member 21, cooperatively positioned and carried by top plate 12. The rotatable table or plate 22 is secured to the thrust bearing 19.

To rotate the hollow shaft, a spur gear 23 is secured to the lower end thereof and is engaged by a spur gear 24 carried upon a shaft 26. Shaft 26 is supported in bearings 28, 29 mounted on the plate 13 and on the plate 16, respectively. A bevel gear 31 on shaft 26 is in engagement with a bevel gear 32 on a shaft in a speed reducing unit, generally indicated at 33, and which unit is in turn driven from an electric motor 34. A stationary shaft 36 extends through the rotatable hollow shaft 18, the lower end of shaft 36 being secured to the plate 14 as at 37. The shaft 36 is suitably journaled in the hollow shaft 18 and extends above plate 22 to support, in a fixed position, a cam indicated at 38, the shaft 36 having a collar 39 fixed thereon, which supports the cam 38.

Mounted upon table or plate 22 are the several sleeving devices 51, upon which the respective bags are supported while the supplemental sheets are being applied thereto. Each sleeving device 51 includes a bottom plate member 52 secured adjacent the periphery of the circular plate 22, the several devices 51 being equally spaced about the plate. In the form shown on the drawings, I have indicated eight of these devices, but more or less can be included as desired, the number depending on the rate at which the supplemental sheets are to be inserted. The outer end of each plate member 52 includes the somewhat upwardly inclined valve-receiving plate portion 53 having beveled corners as at 53', Fig. 1, and a straight front edge portion 53'', so that each valve-receiving portion 53 is adapted to properly spread and support the valve corner of a bag in a condition such as shown in Fig. 7.

In the form of device shown, the inclined support or back plate 54 for the supplemental sheets has side guide plates 56*a* on each side thereof. The upper ends of the side plates 56*a* may be bent at right angles inwardly toward each other as at 56*b* to engage the upper edge of the supplemental sheet to retain same against sliding up out of proper position during the subsequent operations.

The folding bar 62 for folding the supplemental sheet about the inner edge portion 61 of the bag valve to form a sleeve, extends across the plate portion 53 and is pivotally mounted at each end, as by pins 60 which pass through members 65 disposed at opposite respective sides of each plate member 52. To rock the folding bar 62 about its pivot pins 60, a pair of spaced arms as at 63 (Figs. 1 and 4) are provided at the middle of each bar. A link member 66 is pivotally connected as at 64 between the arms 63. Rods 67 are pivotally connected on the link 66 as at 68. A spring 69 is connected between the pivot 68 and a pin 71 carried by attaching brackets 71' fixed on the under side of plate 52, said spring 69 functioning to take up backlash in the mechanism, and to yieldingly pull the linkage connections downwardly.

The rods 67 extend through an opening in plate 54 to one end of a slide block 71*a*, Fig. 2, mounted in a slide guide 72 fixed on plate 22. The other end of each slide block 71*a* carries a roller 74 which is urged into engagement with the cam 38 by a spring 73 which extends between block 71*a* and a flanged member 41 loosely mounted on shaft 36. As the roller 74 comes into engagement with the lobe of the cam 38, the rods 67 are moved to the left, Fig. 3, causing link 66 to move toward the left, Fig. 3, to thereby press the outer upper edge of the bar 62 downwardly to apply pressure against the plate member 52, the spring 69 tending to pull the linkage downwardly so that yieldable pressure is applied to the folded sheet parts. As the roller 74 comes into engagement with a low part of cam 38, the reverse action occurs, link 66 moving toward the right, Fig. 3, to thereby raise the outer upper edge of bar 62 from the plate member 52, whereupon the parts assume the position shown in Fig. 4.

The operation will now be described in further detail in connection with one of the sleeving devices 51 and it will be understood that each of

the other sleeving devices 51 operates in substantially the same manner. Operation of the motor 34, Fig. 2, is initiated, causing the table or plate 22 together with the sleeving devices 51 to rotate slowly in a counterclockwise direction, Fig. 1. As a sleeving device 51 passes station A for example, the operator takes a supplemental sheet, which has been creased and glued in the manner hereinbefore described, and places said sheet upon said sleeving device 51 in the manner above explained, and as shown in Fig. 4. It will be noted that, at this station, roller 74 is in engagement with a low part of cam 38 so that the outer edge of the folding bar 62 is spaced from the plate portion 53, as shown in Fig. 4.

As said sleeving device moves to station B, the valved corner 56 of the bag is spread apart as in Fig. 7, and placed in position upon the plate portion 53 as above explained. As this substantially plane spread corner area is placed over the plate portion 53, the corner creases 106, 107 engage interiorly of the bag, the respective beveled corners 53', 53', and the creases at 104 in the gusset surfaces engage the edge 53'' interiorly of the bag. As shown best in Fig. 3, the gusseted walls of the bag extend downwardly from the plate 53 and beneath the plate 22 so that the bag is maintained in the described position as the operation continues. When the bag is thus positioned, the inner edge portions 61 of the bag valve extend onto the plate 53 far enough so that said edge portions overlie and engage the adhesive stripe 81 and fit snugly within the crease 79.

As the sleeving device passes to stations C and D, the roller 74 engages the lobe of cam 38. Thereupon, the upper edge of bar 62 is swung outwardly and downwardly, engaging the sleeve portion 84 of the supplemental sheet and pressing such portion into engagement with the spread corner 56 of the bag. When the bar 62 is in the position shown in Fig. 5, the sleeve portion 84 is completely folded over, and the inner edge 61 of the bag valve is pressed firmly against the glued portion 83 and adhesive stripe 81 of the supplemental sheet. The parts may remain in this posititon as the sleeving device passes stations E and F, thus allowing the glue to set whereby the supplemental sheet is firmly secured to the bag.

At station G, the roller 74 again engages a low part of the cam 38 with the result that the outer edge of bar 62 moves upwardly out of engagement with the supplemental sheet. As the sleeving device passes on to station H, the bag may be removed, whereupon the supplemental sheet and spread corner of the bag are folded inwardly along the central fold line 102 so that said supplemental sheet forms a sleeve in the valve, as indicated by Fig. 8, and extends a short distance outside the bag. Fig. 8 shows substantially the positions which the sleeve edges and portions 82, 84, 85 will assume on the finished bag. The bag is now ready for sewing of its open ends or other processing.

It will be apparent that the present invention simplifies and facilitates the hand operations previously required to insert a supplemental sheet in sleeve-forming position upon a valved bag. Moreover, after the supplemental sheet and bag have been placed in their respective positions upon one of the sleeving devices, no further hand operations are necessary until the bag is ready to be removed and creased to form the tuck-in sleeve in the valve. Furthermore, the speed of operation may be so regulated that the adhesive has ample opportunity to set before the bag is removed, thus insuring that the supplemental sheet will not slip from its desired position with respect to the spread corner of the bag as may frequently happen with the usual manual operations. It will be further apparent that the apparatus may be made of durable construction and is very simple and dependable in operation for insuring accurate placement of the sleeves.

While the invention has been described with respect to a present preferred embodiment which has given satisfactory results, it will be understood by those skilled in the art, after understanding the invention, that various changes and modifications may be made without departing from the spirit and scope of the invention and it is intended, therefore, in the appended claims to cover all such changes and modifications.

What is claimed as new and desired to be secured by Letters Patent is:

1. In apparatus for applying supplemental sheets to form sleeves in valve bags, a rotatable table, and a plurality of sleeving devices disposed around the periphery of said table, each of said sleeving devices comprising a support for holding a supplemental sheet in position to be engaged by the spread valve corner of a bag, a substantially horizontal plate for supporting the bag with the spread corner thereof in engagement with a portion of said supplemental sheet, and a folder member operable upon rotation of said table to press another portion of the supplemental sheet against the spread corner of the bag so that said other portion engages and is retained in engagement with the spread corner, said folder member being releasable upon further rotation of said table to permit the bag to be removed from the sleeving device with the supplemental sheet in sleeve-forming position on the spread corner.

2. In apparatus for applying supplemental sheets to form sleeves in valve bags, a rotatable table having a plurality of sleeving devices spaced around the periphery thereof, each of said sleeving devices comprising a guide plate, an inclined back plate for receiving a supplemental sheet and adapted for holding same under the influence of gravity and for supporting the same cooperatively with and adjacent to said guide plate, said guide plate being adapted to receive a bag with a spread valve corner thereof in engagement with a portion of said supplemental sheet, and means operable upon rotation of said table to fold another portion of said supplemental sheet into engagement with the spread corner, said last-named means being releasable upon further rotation of said table to permit the bag to be removed from the sleeving device with the supplemental sheet in sleeve-forming position on the spread corner.

3. In apparatus for applying supplemental sheets to form sleeves in valve bags, a table rotatable upon a vertical axis, a plurality of sleeving devices disposed around the periphery of said table, each of said devices comprising a support extending generally inwardly and upwardly adjacent the edge of said table for holding a supplemental sheet in position to be engaged by a spread valve corner of a bag, a substantially horizontal plate adjacent the base of said support and protruding outwardly from the table, said plate being adapted for supporting the bag with a spread corner thereof in engagement with a portion of said supplemental sheet, a supplemental sheet folder, and mechanism for operating said

folder in response to rotation of said table to press another portion of said sheet against the spread corner of the bag, said folder being releasable upon further rotation of the table to permit the bag to be removed from the sleeving device with the supplemental sheet in sleeve-forming position on the spread corner.

4. In apparatus for applying supplemental sheets to form sleeves in valve bags, a rotatable table having a plurality of sleeving devices spaced around the margin thereof, said table being rotatable about a vertical axis, each of said devices comprising a substantially horizontal guide plate for supporting and spreading a corner of a valve bag, a supplemental sheet support extending generally inwardly and upwardly adjacent the edge of said table for supporting a creased supplemental sheet having an adhesive coated portion whereby the adhesive coated portion is adjacent and parallel to said plate and in engagement with said bag corner, said guide plate being adjacent the base of said support and protruding outwardly from the table, a supplemental sheet folding arm, and mechanism for operating said arm in response to rotation of said table to fold another portion of said sheet into engagement with the spread corner, said sheet folding arms being releasable upon further rotation of said table to permit the bag to be removed from the sleeving device with the supplemental sheet in sleeve-forming position.

5. In apparatus for applying supplemental sheets to form sleeves in valve bags, a table rotatable about a vertical axis having a plurality of sleeving devices spaced around the margin thereof, each of said sleeving devices comprising an inclined back plate for supporting a supplementary sheet having adhesive upon a portion thereof, said back plate extending generally inwardly and upwardly adjacent the edge of said table, a substantially horizontal guide plate adjacent the base of said back plate and protruding outwardly from the table, said guide plate having a beveled and inclined valve corner receiving and spreading portion adapted for retaining a spread valve corner in engagement with said adhesive covered supplementary sheet portion, a folding bar for engaging said supplementary sheet and folding another portion thereof over said valve corner, and mechanism operating said bar in response to rotation of said table and releasable in response to further rotation of said table.

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