Aug. 23, 1932. E. L. SMITH 1,873,060

WRAPPING MACHINE

Filed July 8, 1931 3 Sheets-Sheet 1

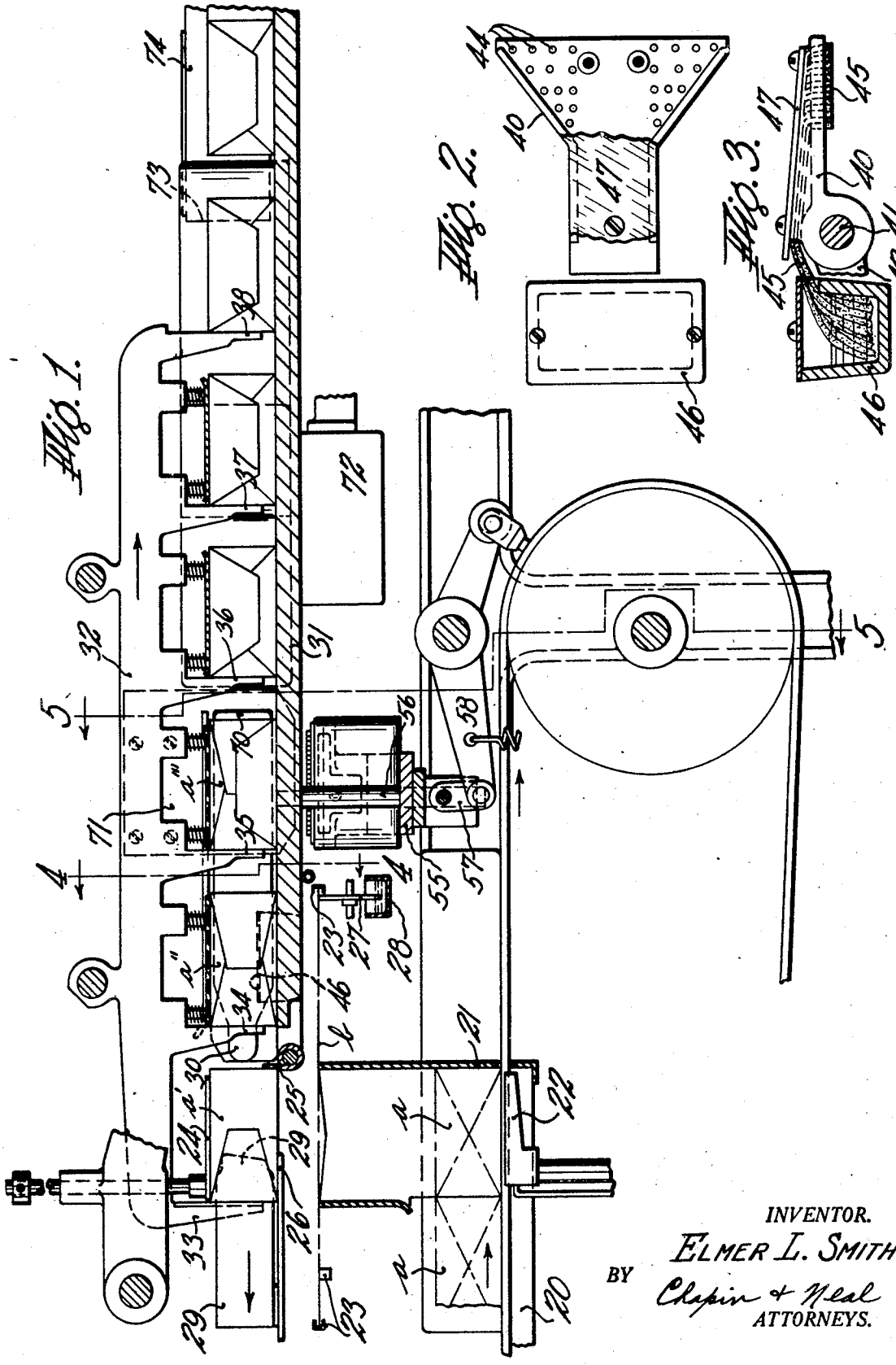


Fig. 1.

Fig. 2.

Fig. 3.

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Fig. 4.

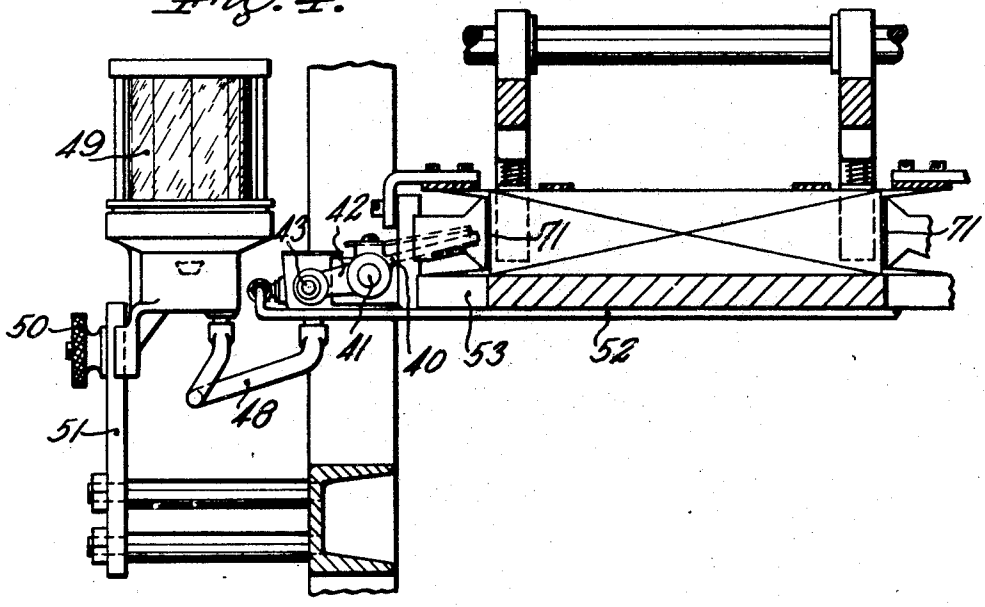
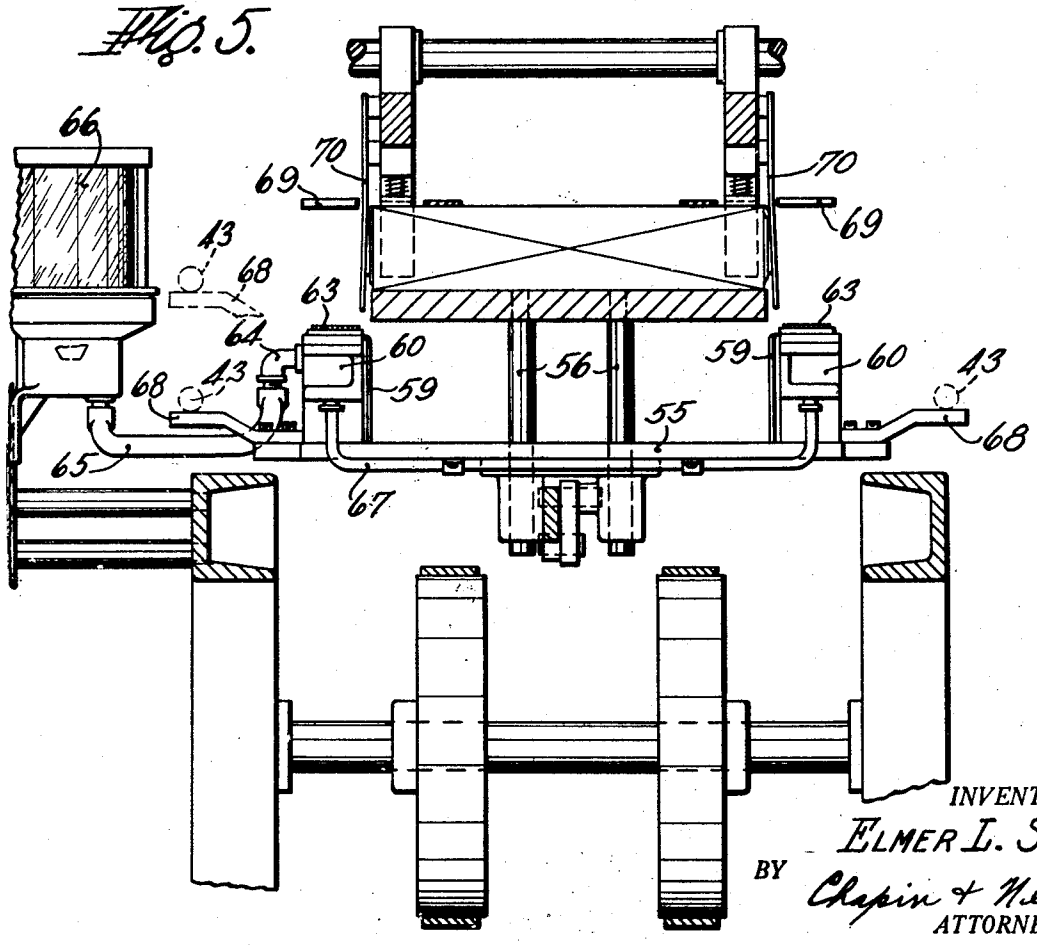


Fig. 5.



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Fig. 6.

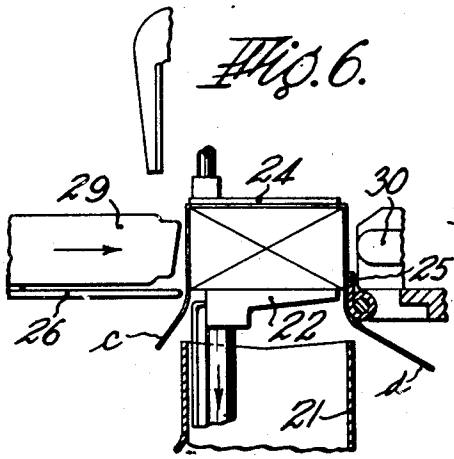


Fig. 7.

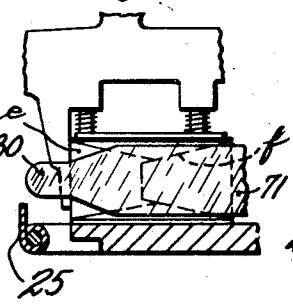


Fig. 8.

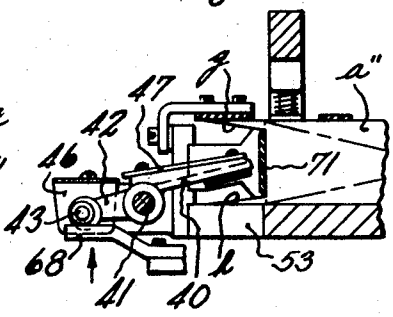


Fig. 9.

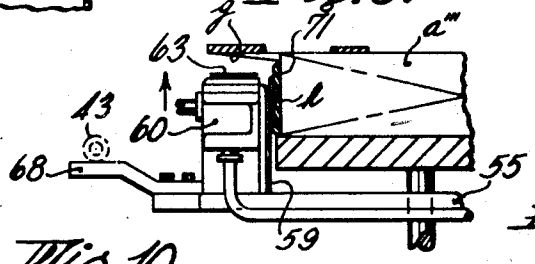


Fig. 10.

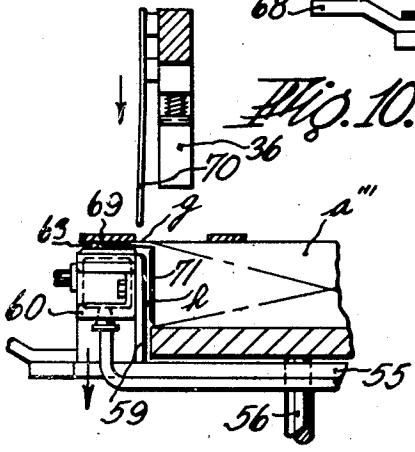


Fig. 13.

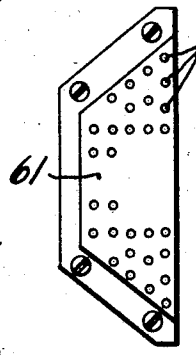


Fig. 14.

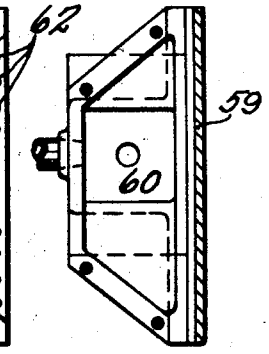


Fig. 11.

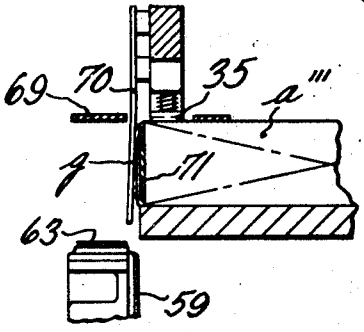


Fig. 12.

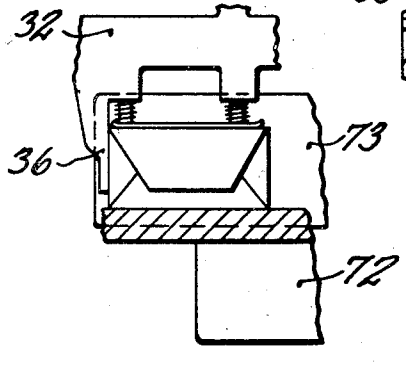
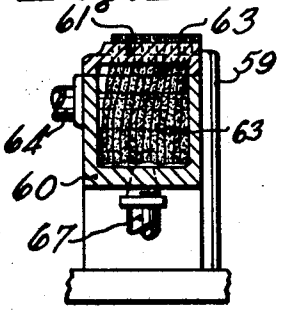


Fig. 15.



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UNITED STATES PATENT OFFICE

ELMER LOVELL SMITH, OF LONGMEADOW, MASSACHUSETTS, ASSIGNOR TO PACKAGE MACHINERY COMPANY, OF SPRINGFIELD, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS

WRAPPING MACHINE

Application filed July 8, 1931. Serial No. 549,433.

This invention relates to wrapping machines, and has particular reference to machines which are designed to wrap articles in a material, such as moisture-proof cellophane, which carries on its surface a coating soluble in a suitable solvent. In one commercial form this material comprises a cellulose base and a coating having among its ingredients a nitrocellulose and a wax, the coating being soluble in various organic solvents such as acetone or ethylene glycol monomethyl ether. One object of the invention is to provide a machine which will handle this material cheaply and economically and which will produce a tight seal. A further object is to provide improved mechanism for making the successive folds and for applying a sealing liquid to the parts of the wrapper which are to be overlapped. A further object is to provide a device for applying a sealing liquid, which device is capable of entering between spaced apart flaps and applying liquid to one of the inner surfaces thereof. A further object is to provide a machine capable of producing a solvent sealed package having a wrapper closed by the two point type of fold. Additional objects will appear from the following description and claims.

The invention will now be described with reference to the accompanying drawings, in which:

Fig. 1 is a median sectional elevation with the articles shown in full of a wrapping machine of the general type shown in the patent to Smith and Fuller No. 1,575,723, March 9, 1926, illustrating the adaptation thereto of one embodiment of my invention;

Fig. 2 is a top plan view, partly broken away; and Fig. 3 is a central elevational section, of the solvent applier for the first bottom flap;

Fig. 4 is a section on line 4—4 of Fig. 1;

Fig. 5 is a section on line 5—5 of Fig. 1;

Figs. 6 to 12 inclusive are diagrammatic details illustrating the manner in which successive folds are made and caused to adhere;

Figs. 13 and 14 are respectively a top plan view of a cover plate for the second solvent applier, and a detail of the device with the cover plate removed; and

Fig. 15 is a central vertical section through the second solvent applier.

The wrapping machine to which the invention has been applied is in general the same as that shown in the Smith and Fuller Patent No. 1,575,723, and it has not been described herein except insofar as it supplies the necessary environment. Reference may be made to that patent for a complete description of the wrapping mechanism and the operating parts. The articles *a* to be wrapped are fed along a support 20 (Fig. 1) until they strike an abutment 21. In this position they are above an elevator 22 and below a sheet of wrapping material *b* which has been fed by suitable mechanism onto suitable supports 23. As the article and wrapper are carried upwardly by the elevator, the wrapper is held in place by a weighted plunger 24 and is draped downwardly into inverted U-form (Fig. 6) by a spring pressed flapper 25 and by a stationary abutment opposed thereto. The rear side *c* of the wrapper is folded under the article by the reciprocating folder 26, the front side *d* being folded over it by the flapper 25 as the article is moved forwardly. The edge *d* has previously received a stripe of solvent by means of a wheel 27 running in a tank 28 and positioned in the path of the wrapper as the latter is drawn into the machine. The coating on the wrapping material is softened and rendered adherent by the solvent and consequently adheres to and softens the coating on the flap *c* when these have been brought into contact. At the same time that these bottom folds are being made, the rear tucks *e* are made by reciprocating folders 29 and the front folds *f* by stationary folders 30.

The wrapper has now been completely folded around the article and front and rear tucks formed in each end extension. This leaves an upper flap *g* and a lower flap *h* at each end which must each be coated with solvent upon their inner face and folded against the end of the package. The mechanism by which this is accomplished will now be described. The partially wrapped article is moved intermittently along the bed plate 31 by a transport mechanism of the orbital

type (as described in the Smith and Fuller patent referred to), comprising a movable frame 32 provided with suitable operating mechanism shown in the patent but not here, and with a series of article pushers 33 to 38 inclusive. The pusher 33 carries the article from the position a' where it is left by the elevator to a position a'' at which solvent is applied. The solvent applying device at this position has been omitted from Fig. 1 to avoid confusion, but appears in detail in Figs. 2, 3, 4 and 8.

Referring to the figures just mentioned, and describing only one of the two identical but opposite devices, an arm 40 is pivoted upon a shaft 41. A second arm 42 forming a part of or secured to the first carries a roll 43 which is actuated once during each machine cycle to swing the arm 40 downwardly. In its normal position, shown in Figs. 4 and 8, the arm lies in such a position as to project between the upper and lower flaps g and h which straddle it as the partially wrapped article is advanced into position. When the roll 43 is raised, the arm 40 is lowered temporarily to come in contact with the lower flap. The arm is flared at its wrapper contacting end (Fig. 2) and is perforated at 44 to receive a plurality of string-like wicks 45 which run into a covered receptable 46. A cover plate 47 overlies the wicks to prevent evaporation of the solvent. The receptacle 46 is connected by a flexible tube 48 with a liquid supply 49 of the constant level type common in kerosene stoves and similar devices, which is adjustable as to level by a clamp screw 50 upon a stationary bracket 51. A supply device of this character has been described in detail in the application of Paul Langhammer, Serial No. 507,923, filed January 10, 1931, and need not be considered at length here. It operates to supply a sealing liquid, such as an organic solvent of the type referred to above, under a constant head to the wicks 45. A pipe 52 joins the illustrated receptacle 46 with the similar one on the opposite side of the machine. The wicks terminate just below the flat surface of the flared end of the arm 40, and are preferably opened out or matted down against that surface both to prevent their being pushed back through the holes in the arm and to present a substantially continuous solvent delivering area as the arm is swung to press the flap h against the horizontal rail 53.

After the arm 40 has applied solvent to the lower flap in the manner described, the article is engaged by the pusher 34 and shifted to the position a'''. At this point the lower flaps h are folded against the article end and the under surfaces of the upper flaps are coated with solvent. The apparatus by which this is done is shown in Figs. 1, 5, 9, 10, 13, 14 and 15. Again the description will be confined to the mechanism at one side of the machine. A cross head 55 is guided on suitable posts 56, and has a periodical reciprocation given to it by a link 57 and a rocker 58 operated by any suitable cam mechanism. At each end of the cross head is a folder plate 59 and a solvent receptacle 60. The top of the receptacle is provided with a cover plate 61 having perforations 62 through which pass wicks 63 extending into the receptacle and matted down on top of the cover. The wicks are, as best shown in Fig. 13, restricted in their area so that the portion of the flap h which contacts with the end of the package rather than with the other surfaces of the tucks e and f will not be solutioned. This is of importance in case the package to be wrapped in the transparent cellophane has a printed inside wrapper, as the solvent used will affect the ink. A pipe 64 enters the receptacle at a point above its bottom and is connected by a flexible tube 65 with a constant level supply 66 similar to the supply 49 previously referred to. By joining the pipe to the receptacle above its bottom, a supply of solvent will be trapped in the chamber, even though the receptacle moves above the point where solvent will run in from the supply 66. The pipe 67 joins the bottom of the described receptacle 60 with the similar one on the opposite side of the machine. Attached to each end of the cross head is an abutment 68 (Fig. 5) which, when the cross head is elevated, strikes against the roller 43 and actuates the solvent applier for the bottom flap h on the next following article.

As the cross head is raised, the folding plate 59 comes in contact with the lower fold h and folds it against the end of the article. When the upper position of the cross head is reached, the wicks 63 contact with the inner surface of the upper flap g and press it against a horizontal rail 69 extending beyond the end of the package. A coating of solvent is thus applied and the flap rendered adhesive and in condition to be applied to the previously folded lower flap. The upper flap is folded by a plate 70 attached to the pusher 35 and carried downwardly in the orbital movement of the transporter. As shown, the plates 59 and 70 carry their respective flaps over a thin plate 71 attached to the stationary tucker 30 and extending past the position a'''. The use of this plate produces a tighter and more regular fold, but it may be omitted if desired. The article with all of its flaps folded is carried along the bed plate 31 by the transporter past a bottom heater 72 and end heaters 73 by which the solvent is evaporated, and is finally deposited between the usual delivery belts 74 which convey the articles out of the machine and hold the flaps tightly together until adherence is complete.

Claims:

1. A wrapping machine comprising means for folding a wrapper about an article so

as to leave opposite flaps spaced apart, and a device extending into the space between the flaps to apply a sealing liquid to one of them.

2. A wrapping machine comprising means for folding a wrapper about an article so as to leave opposite flaps spaced apart, and a device extending into the space between the flaps and movable against the inner surface of one of them to apply a sealing liquid thereto.

3. A wrapping machine comprising means for folding a wrapper about an article with a tubular extension of the wrapper beyond the article end, means for forming opposite tucks in the extension leaving opposite flaps spaced apart, transporting mechanism moving the partially wrapped article, a solvent carrying device positioned intermediate the paths of said opposite flaps so that the flaps straddle it as the article is moved along, and means for shifting said device from its intermediate position into contact with the inner surface of one of the flaps.

4. A wrapping machine comprising means for folding a wrapper about an article with tubular extensions of the wrapper at each end of the article, means for forming opposite tucks in each of said extensions leaving opposite flaps spaced apart, and a pair of devices each extending into the space between one pair of said flaps and movable against the inner surface of one flap of the pair to apply a sealing liquid thereto.

5. A wrapping machine comprising means for folding a wrapper about an article so as to leave opposite flaps spaced apart, a member extending into the space between the flaps and having a wick terminating on the surface of the member adjacent the inner surface of one of the flaps, means for supplying a solvent to the wick, and means for moving the member so as to bring its wick-supplied surface against the inner surface of said flap.

6. A wrapping machine comprising means for forwarding along a path an article having projecting flaps spaced apart, a member pivoted adjacent said path so as to extend into the space between the flaps as the article is forwarded to a position in front of the member, a reservoir associated with the member, a wicking joining the reservoir with the surface of the member, and means for oscillating the member on its pivot to bring the wicking against the inner surface of one of the spaced flaps.

7. A wrapping machine comprising means for forming opposed tucks in the tubular extension of a wrapper leaving a portion of the article end exposed, means for applying a sealing liquid to the inner surface of one of the projecting flaps in a pattern such that when the flap is folded against the article the liquid coated portions will contact with the outer surfaces of the tuck but not with the end of the article, means for folding said coated flap against the article end, and mechanism for folding and sealing the remaining flap against the previously laid flaps.

8. A wrapping machine comprising a wrapping channel, means for feeding partially wrapped articles along the channel, a reciprocable folder engageable with one end flap of the wrapper to fold it against the article, and a solvent applying device carried thereby for applying a solvent to the inner surface of the opposite end flap.

9. A wrapping machine comprising a wrapping channel, means for feeding partially wrapped articles along the channel, a reciprocable folder engageable with one end flap of the wrapper to fold it against the article, a solvent reservoir carried by the folder, and a wicking extending from the reservoir into position to engage the inner surface of an opposite end flap upon the reciprocation of the folder.

10. A wrapping machine comprising a horizontal guideway, means for impelling intermittently along the guideway a series of partially wrapped articles having tubular wrapper extensions at each end, devices for forming front and rear tucks in each wrapper extension, means operable at one station of rest of the articles for applying a sealing liquid to the inner surface of one of the flaps so formed at each end, reciprocable folders operable at a succeeding station of rest for folding said flaps against the previously folded tucks, a device movable with the folder for applying sealing liquid to the inner surface of the opposite flaps, and means for folding the second pair of flaps upon the first pair.

11. A wrapping machine comprising means for supporting an article with a flap extending horizontally therefrom, a vertically reciprocable member having a solvent chamber therein and carrying wicks extending from the chamber into position to engage the flap, a constant level solvent supply, and a pipe connecting said supply to a point of the chamber above the bottom thereof, whereby a quantity of solvent will be trapped in the chamber during the vertical reciprocation of the member.

In testimony whereof I have affixed my signature.

ELMER LOVELL SMITH.