Aug. 8, 1961 M B. GWINN ET AL 2,994,997

SHIRT BAGGING MACHINE

Filed Nov. 7, 1958 5 Sheets-Sheet 1

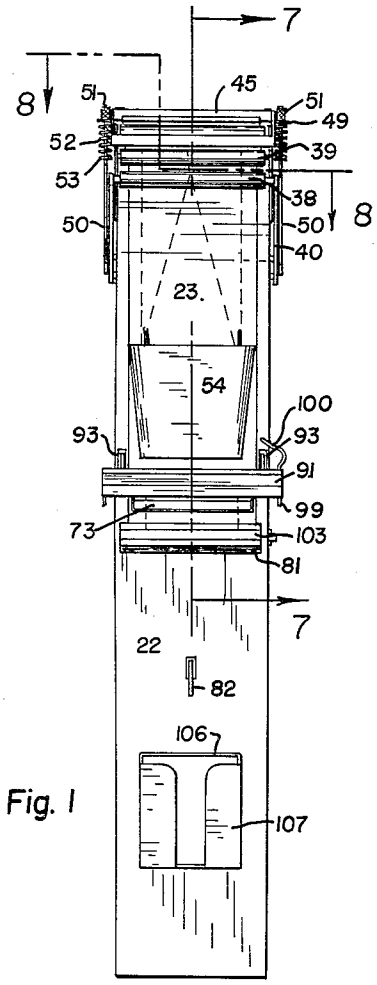

Fig. 1

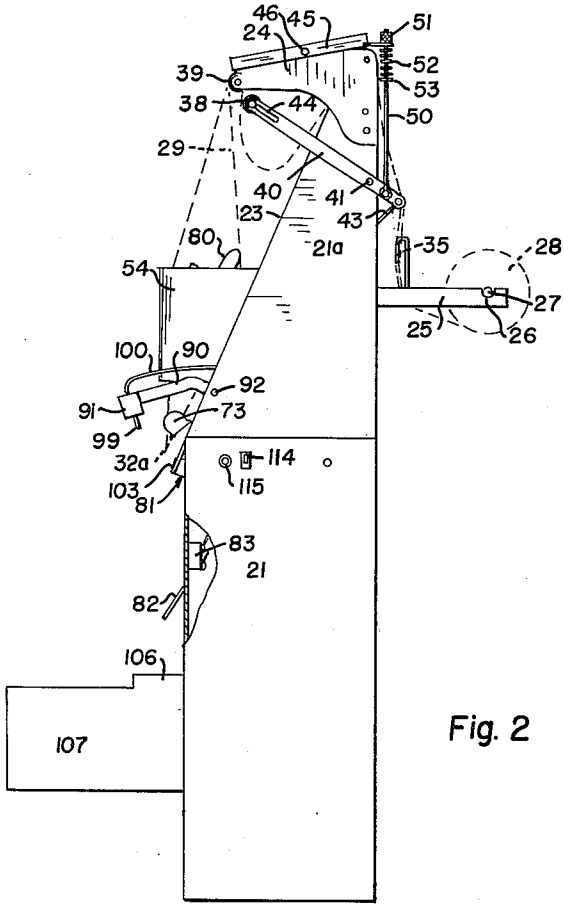

Fig. 2

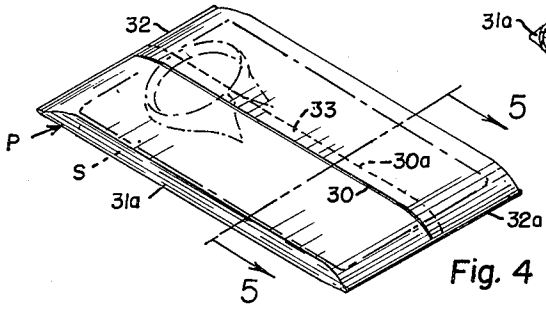

Fig. 4

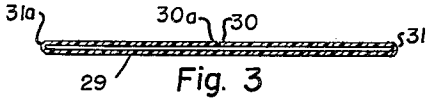

Fig. 3

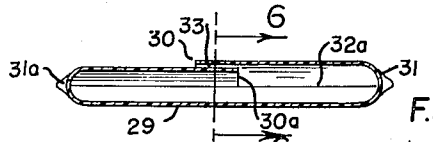

Fig. 5

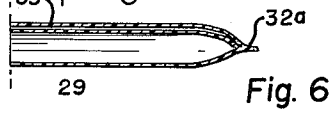

Fig. 6

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SHIRT BAGGING MACHINE

Filed Nov. 7, 1958 5 Sheets-Sheet 2

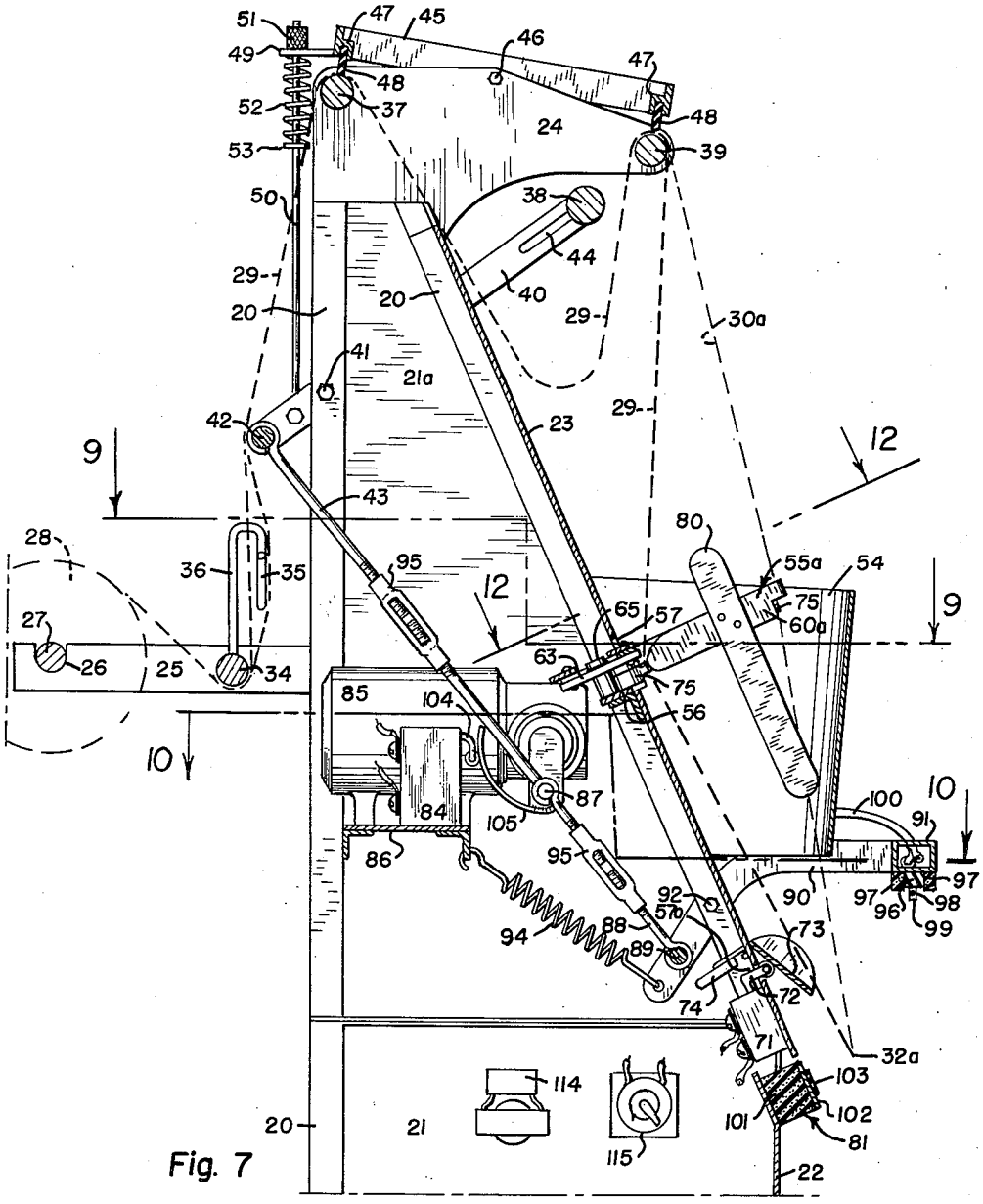

Fig. 7

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SHIRT BAGGING MACHINE

Filed Nov. 7, 1958 5 Sheets-Sheet 3

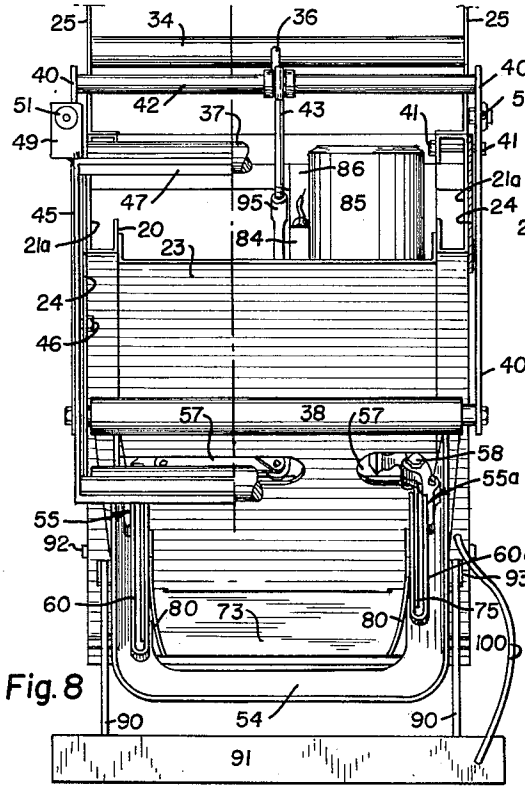

Fig. 8

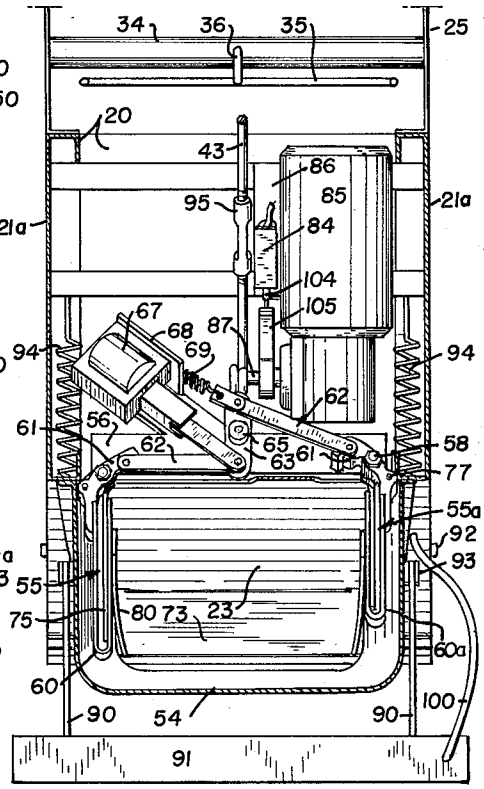

Fig. 9

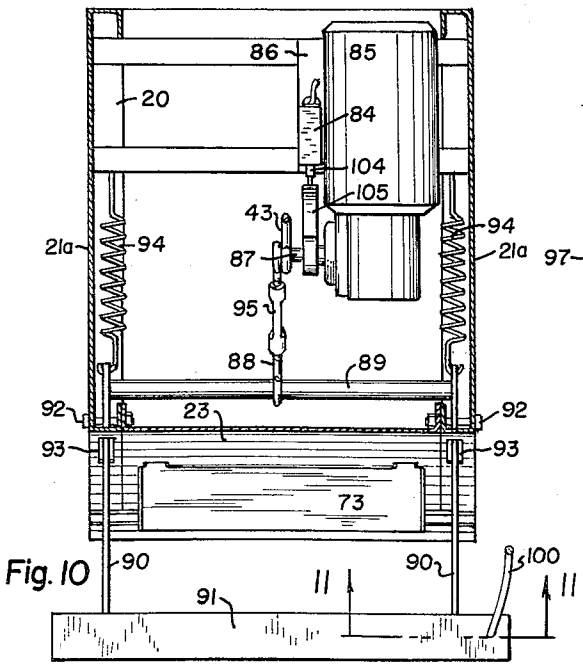

Fig. 10

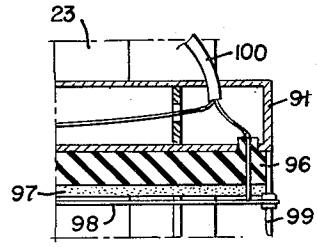

Fig. 11

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SHIRT BAGGING MACHINE

Filed Nov. 7, 1958 5 Sheets-Sheet 4

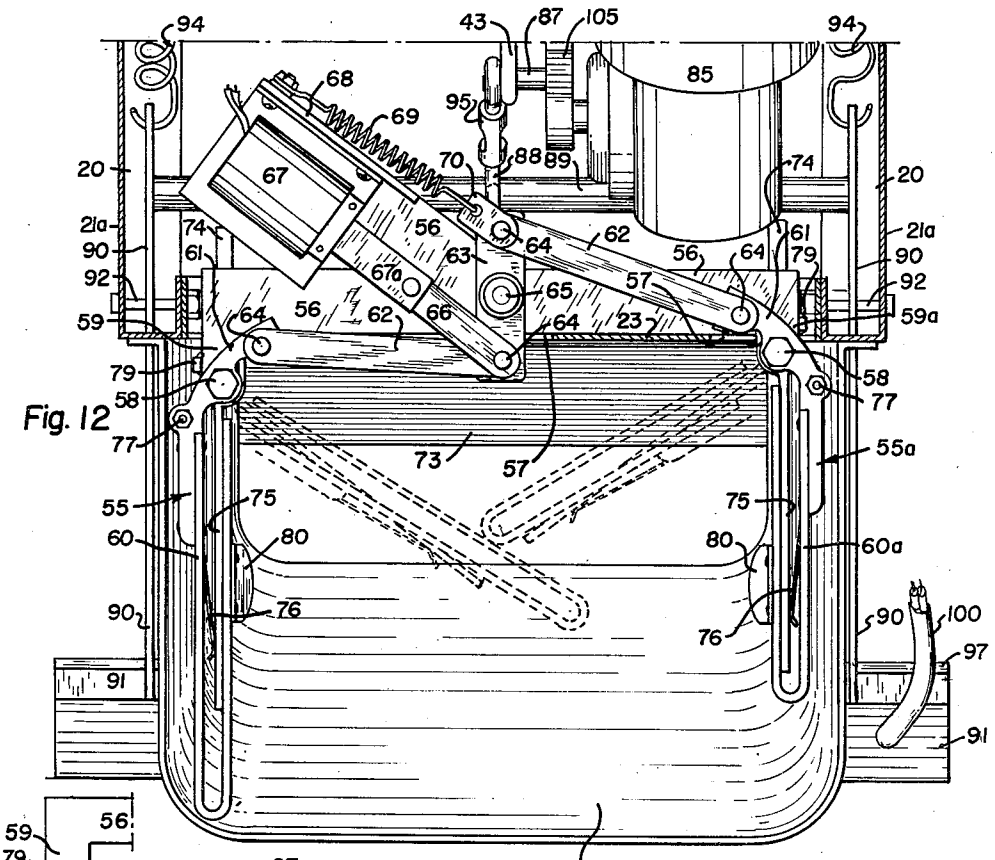

Fig. 12

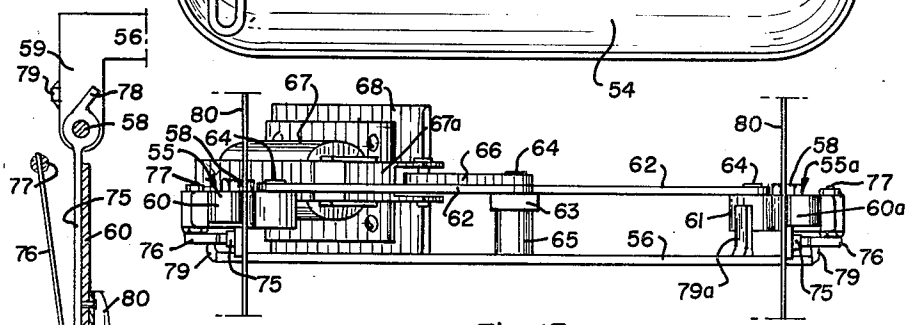

Fig. 13

Fig. 15

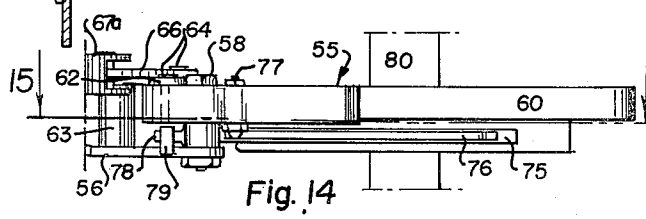

Fig. 14

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SHIRT BAGGING MACHINE

Filed Nov. 7, 1958 5 Sheets-Sheet 5

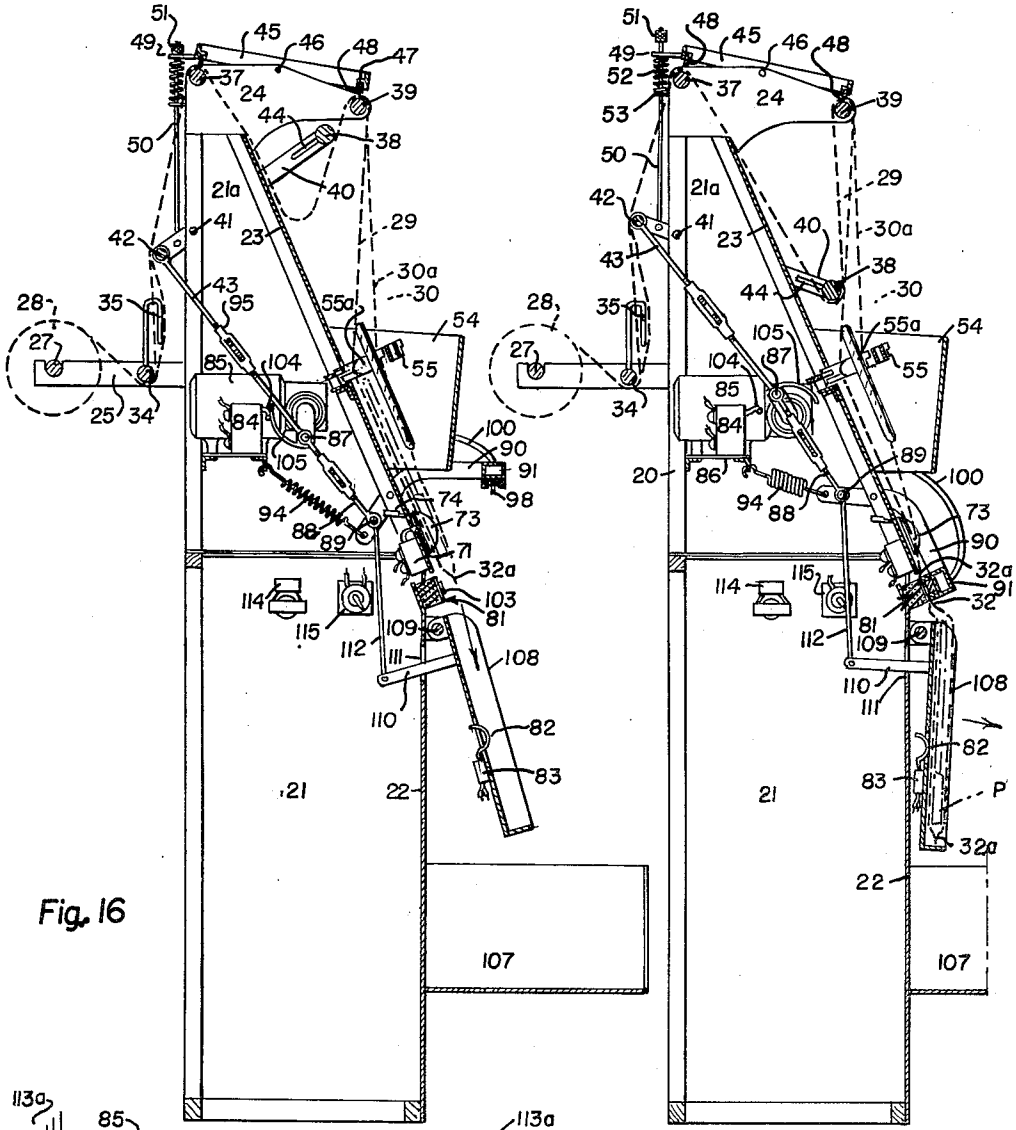

Fig. 16

Fig. 17

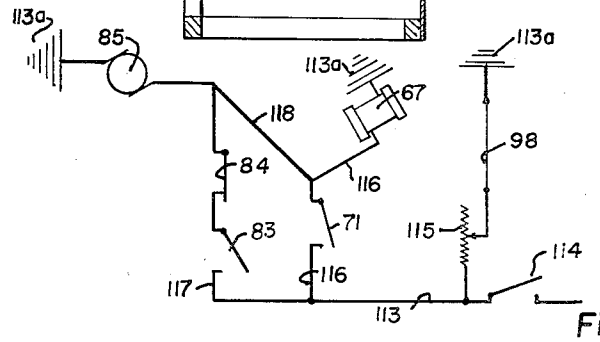

Fig. 18

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United States Patent Office 2,994,997 Patented Aug. 8, 1961

2,994,997

SHIRT BAGGING MACHINE

M Benjamin Gwinn and Earl P. Buchmiller, Denver, Colo., assignors to National Paper Band Company, a corporation of Colorado

Filed Nov. 7, 1958, Ser. No. 772,539
14 Claims. (Cl. 53—182)

This invention relates to packaging and bagging machinery and more particularly to semi-automatic types of packaging and bagging machines which are adapted to encase and bag an article moving through the machine. The primary object of the invention is to provide a novel and improved semi-automatic bagging machine which is especially adapted to receive a laundered and folded shirt dropped therein and to envelope or bag the shirt in a sheet of plastic film. As such, the invention will be hereinafter referred to as a shirt bagging machine, although it is to be understood that this specific use, for shirts, is not a limitation of the capabilities of and applications for the machine.

Another object of the invention is to provide a novel and improved semi-automatic shirt bagging machine which is adapted to pay off selected lengths of a web of sheet material from a supply roll and to wrap and seal the same about a shirt dropped into the machine.

Another object of the invention is to provide a novel and improved semi-automatic shirt bagging machine which is adapted to receive a selected length of web of prefolded sheet material, open the folds thereof to form a shirt receiving pocket therein and refold the web upon a shirt dropped into the machine.

Yet another object of the invention is to provide a novel and improved shirt bagging machine which is adapted to open the end portion of a folded web of sheet material for receiving a shirt at one station, to refold the web over the shirt and shift the folded package to a further station for cutting and sealing the ends of the web to provide for an individually packaged or bagged shirt.

Another object of the invention is to provide a novel and improved semi-automatic shirt bagging machine which is adapted to wrap and seal the end portion of a web of sheet material about a laundered and folded shirt as the shirt is dropped through the machine, to sever the web for release of the bagged shirt from the machine and to position the end portion of the remaining web in the machine for receiving another shirt.

Another object of the invention is to provide a novel and improved semi-automatic shirt bagging machine which is especially adapted to wrap and bag a laundered and folded shirt in a web of thermoplastic sheet material such as polyethylene film.

Another object of the invention is to provide a novel and improved shirt package which fully encases a laundered and folded shirt therein with an overlapping ventilating opening along a face thereof arranged in such a manner as to eliminate the possibility of the shirt from slipping out of the package or becoming otherwise exposed and soiled by contact with exterior objects or surfaces whereon the shirt may be placed.

Another object of the invention is to provide such novel and improved shirt package with an overlapping ventilating opening in the face thereof, which is especially adapted to be made of thermoplastic sheet material such as polyethylene film.

Yet another object of the invention is to provide a novel and improved shirt bagging machine which is adapted to automatically wrap and individually bag a laundered and folded shirt dropped into the machine and to deliver the bagged shirt in a stacking receptor at the base of the machine.

Yet other objects of the invention are to provide in a novel and improved semi-automatic shirt bagging machine which is easy to use, reliable and fast in operation, perfectly safe, and is a low-cost, neat-appearing, rugged and durable unit.

With the foregoing and other objects in view, all of which more fully hereinafter appear, our invention comprises certain novel and improved constructions, combinations and arrangements of parts and elements as hereinafter described, defined in the appended claims and illustrated in preferred embodiment in the accompanying drawing in which:

FIGURE 1 is a front elevation view of the improved bagging machine with broken lines indicating an opened, prefolded web of wrapping film in the machine arranged for receiving a folded shirt preparatory to bagging it.

FIGURE 2 is a side elevation view of the machine illustrated at FIG. 1 with broken lines indicating a roll of wrapping film and the web of film extending therefrom and through the machine.

FIGURE 3 is a transverse sectional view of the film web used in the machine, illustrating the manner in which the edges of the web are overfolded upon the central portion thereof and the manner in which the web is folded in the roll, preliminary to use in the bagging machine, the relative thickness of the web being somewhat exaggerated to better illustrate the manner in which it is folded.

FIGURE 4 is a perspective view of a completed bag formed in accordance with the principles of the invention, with a folded shirt therein being indicated in dot-dash lines and with a longitudinal edge portion of the web forming the bag being normally hidden from view, and indicated by a broken line.

FIGURE 5 is a transverse sectional view of the bag per se as taken from the indicated line 5—5 at FIG. 4, but with the relative thickness of the web being somewhat exaggerated to better illustrate the structure thereof.

FIGURE 6 is a fragmentary portion of a longitudinal sectional view of the bag as taken from the indicated line 6—6 at FIG. 5.

FIGURE 7 is a transverse sectional elevation view of the upper portion of the bagging machine as taken from the indicated line 7—7 at FIG. 1, but on an enlarged scale and with broken line indicating the roll of film and the web therefrom extending through the machine.

FIGURE 8 is a partial plan view and a partial sectional view of the bagging machine as taken from the indicated line 8—8 at FIG. 1, but on an enlarged scale.

FIGURE 9 is a sectional plan view of the machine as taken substantially from the indicated line 9—9 at FIG. 7.

FIGURE 10 is a sectional plan view of the machine as taken substantially from the indicated line 10—10 at FIG. 7.

FIGURE 11 is a fragmentary sectional detail view as taken from the indicated line 11—11 at FIG. 10, but on a further enlarged scale.

FIGURE 12 is a fragmentary sectional detail view as taken substantially from the indicated line 12—12 at FIG. 7, but on a further enlarged scale and with broken lines indicating alternate operative positions of certain elements illustrated therein.

FIGURE 13 is a front elevation view of selected elements illustrated at FIG. 12 with portions of elements being broken away to conserve space.

FIGURE 14 is a side elevation view of portions of the elements illustrated at FIG. 13.

FIGURE 15 is a fragmentary sectional detail view of a portion of the sub-assembly as taken from the indicated line 15—15 at FIG. 14.

FIGURE 16 is a transverse sectional elevation view,

similar to FIG. 7, but on a reduced scale, illustrating the entire machine and also a modification thereof by the inclusion of package placeing means and illustrating further, in broken lines, a roll of film and the web therefrom extending through the machine, and in dot-dash lines, a shirt placed in the machine and illustrating further an initial operative movement of the machine after the shift is drapped therein.

FIGURE 17 is a transverse sectional elevation view, similar to FIG. 16 but illustrating a subsequent operative movement of the machine preliminary to the deposit of a bagged shirt into a container at the base of the machine.

FIGURE 18 is a circuit diagram illustrating one mode of electrical interconnection of the electrically-powered driving elements of the machine.

The art of packaging laundered and folded shirts has developed into a major industry with improved arrangements of bands and boards to facilitate the manner in which the shirt is held in rigid position to avoid wrinkling and distortion of the body of the shirt and especially of the collar, and also to facilitate the manner in which the shirt is wrapped. A further widespread development has been a trend toward individually packaging a laundered folded shirt and it has become almost a standard practice to package shirts in bags of thin transparent plastic sheet material of a thermoplastic type. The outstanding material selected for this purpose is polyethylene since this type of plastic substance can be formed of extremely thin, tough, low-cost sheets which are ideally suitable for making neat-appearing, transparent bags since it can be folded to shape and then quickly sealed with heat however desired.

A polyethylene type bag is substantially impermeable to water and moisture and one condition necessary in bagging a shirt is that a portion of this bag remain open to permit the moisture naturally within the laundered shirt to escape to the atmosphere and avoid condensation, so that the shirt will remain clean and crisp until it is ready for use. Because of this and because of the apparent cheapness of manufacture, polyethylene shirt bags have been formed in the past substantially as open-mouth sacks and the laundered shirts are simply slipped into these bags. There are several disadvantages with this arrangement. In the first place, handling of the bag is actually difficult because each bag must be opened by hand to receive a shirt. Whenever static electricity exists, the bag will often refuse to open or it will be otherwise extremely difficult to handle. Moreover, when this conventional type of shirt bag is used, it is very easy for a shirt to slip out of the opening and have a portion of it become soiled, as when the package inadvertently contacts a dirty surface or a foreign object.

With such in view, the present invention was conceived and developed and comprises, in essence, an improved shirt bagging machine which moves a web of polyethylene or similar film, through various stations where it is adapted to receive a shirt, envelope and bag the same into the polyethylene film and to form a ventilated bag having an overlapping opening arranged in such a manner that the shirt cannot be accidentally exposed therethrough and will be fully protected at all times, and to provide for such packaging and bagging of shirts with a minimum of manual effort and for approximately half the cost of conventional sack-type shirt bags.

Referring more particularly to the drawing, our improved machine is formed upon a vertically-disposed pedestal-like frame **20** with the frame members thereof being enclosed by side-wall-plates **21** and a front-wall-plate **22**, so designated because the face where the packaging operation occurs will be considered the front of the machine. The upper portion of this frame **20** is modified to include a sloping face plate **23** with the side-wall-plate sections **21***a* being triangular in form to provide for an apex at the top rear portion, as illustrated at FIG. 2.

A pair of side arms **24** extend forwardly of the apex section in spaced parallelism to cantilever over and above the sloping face plate **23** to carry spaced, transversely-disposed web-guiding rolls as hereinafter described. A second pair of spaced side arms **25** are affixed to the rear of the machine substantially below this apex to extend and cantilever rearwardly therefrom in spaced parellelism with notches **26** at their extended ends to hold the shaft **27** of a roll of film **28**. A web of film **29** extends from the roll **28** and through the machine for the shirt packaging operation as hereinafter further described in detail.

The film roll forming web **29** is preferably of a thin thermoplastic material, such as polyethylene and is preferably, but not necessarily transparent. It is originally an extended sheet of material with the longitudinal edges **30** and **30***a* being in spaced parallelism, but the web is prepared before being wound to the roll **28** by lapping these edges **30** and **30***a* over the central portion of the web so that the web is of double thickness when it is rolled on the roll **28**. The line of separation of this double thickness web is thus at the center of the web and a fold edge **31** and **31***a* defines the sides of the web as it enters the machine, as in the manner clearly illustrated at FIG. 3.

In the operations which form our improved shirt package P, as hereinafter described, this web is opened by lifting and spreading apart the lapped edge sections, placing the shirt therein, relapping edge portions over the shirt, sealing and cutting off the transverse ends **32** and **32***a* of the package P. However, in forming this package by relapping the edge portions, the edges **30** and **30***a* of the web are overlapped as at **33**, as clearly illustrated at FIGS. 4 and 5. This overlap **33** is not sealed and thus provides for ventilation of the shirt package without the possibility of exposing any portion of the shirt S, and a shirt S contained within the package P will be fully protected from contact with exterior objects and cannot slip out of the package until it is torn apart to remove the shirt.

Movement of the web through the machine from the roll is underneath a guide bar **34** transversely disposed between the rear side arms **25** adjacent to the frame. Thence the web extends upwardly and past and about grounding fingers **35** which extend outwardly from each side of a centrally disposed support arm **36** upstanding from the guide bar. The support arm **36** extends into the web at the center point between the juncture at edges **30** and **30***a* and the grounding fingers extend transversely within the overlapped portions of the web to provide for initial separation thereof and to ground out any static electricity which would impede the subsequent operations of the unit.

The web extends thence upwardly and over a transversely disposed guide bar **37** substantially at the apex point at the top and rear of the unit. The web extends thence forwardly and downwardly to pass underneath a transversely disposed pay bar **38** which is adapted to measure off selected lengths of web as hereinafter described. Thence, forwardly and upwardly and over a transversely disposed front guide bar **39** at the extended end of the front side arms **24**. Thence, the web extends downwardly toward the sloping face plate to mechanisms thereon which open the folds thereof to receive a shirt and which then close the folds and transversely sever and seal the web, all as hereinafter described.

The pay bar **38** is mounted upon a pair of rearwardly extending arms **40** which are connected to the rear side frame members of the machine at pivot **41**. The arms **40** extend rearwardly from this pivot and are interconnected by a transversely disposed spacer bar **42** which is securely affixed to each arm **40** to force them to operate in unison. An actuating thrust arm **43** is mounted at the

center of the spacer bar 42 and upward movement of this thrust arm 43 forces the downward movement of the pay bar 38 to extend the span of web between the guide bar 34 and the front guide bar 39. Adjusting slots 44 are formed in the arms 40 to adjust the space between the pay bar 38 and pivot 41 for corresponding adjustment of the length of web pulled between the guide bars 34 and 39.

The pay-out action to move a selected length of web 29 from the roll 28 and to the front of the machine is through an operation wherein the web is first held at the front guide bar 39 and moves over the top guide bar 37 as the pay bar 38 is depressed as at FIG. 17. Following such action, the pay bar is lifted and the web is then held at the top bar 37 to permit the payed-off length to move over the front guide bar 39 and downwardly for packaging a shirt as hereinafter described.

To accomplish this alternative holding and releasing of the web at guide bars 37 and 39 a rocker 45, formed as an open rectangular frame, is pivotally mounted upon the top arms 24 above said guide bars 37 and 39 with the mounting pivots 46 being transversely between the guide bars and with the front and rear transverse members of the rocker 45 being directly above the guide bars. Each transverse member includes an inverted channel 47 wherein a resilient brake shoe strip 48 depends for the alternative web-holding contact with the guide bars.

This rocker 45 is directly, though resiliently, interconnected with the arms 40 which depress the pay bar 38. An orificed ear 49 outstands from each rear corner of the frame 45 and a rod-shaped, end-threaded link 50 is pivotally connected to the rearwardly extending end of each arm 40 to upstand therefrom and slideably extend through the ear 49 thereabove. An adjustable spacer nut 51 is turned onto the top of each link 50 to abut against the top surface of the ear 49 for adjustment of the pressure of the rear brake shoe 48 against the guide bar 37 when the pay bar 38 is in the normal up position.

A coil spring 52 is threaded on each link 50 beneath the ear 49 and is resiliently held against the underside of the ear by a washer 53 affixed to the link 50. This spring 52 acts to first push the rear end of the rocker 45 upwardly to release the brake at the top guide bar 37 and apply the brake at the front guide bar 39 whenever the arms 40 commence to lower the pay bar 38. The springs then permit continued movement of the links 50 through the ears 49 with the brake 48 being held on the front guide bar 39 as illustrated at FIG. 17.

The movement of the web 29 from the front guide bar 39 is downwardly toward the face plate 23 and into a hopper-shaped trough 54 which outstands from the face plate 23. The overfolded longitudinal edge portions of edges 30 and 30*a* of the web face outwardly from the machine and a pair of spreader arms 55 and 55*a* in the trough 54 lift these overfolded edges to an open position, approximately 90 degrees from the plane of the web and substantially to the sides of the trough 54. This lifting of the edge portions is progressive from the fully overfolded condition at the front guide bar 39 to the opened position at the spreader arms 55 and 55*a*. In accordance with the principles of the invention, the web is refolded below said opened position at the spreader arms and also overlapped as at 33, FIG. 4, with a lower transverse end of the web being completely folded and sealed for formation of one end 32*a*, of a shirt package P. This opening of the web at the arms 55 and 55*a* and the refolding and lapping therebelow to form a sealed end 32*a* will break the downwardly directed alignment of the web in a manner which substantially fits the sloping face plate whenever the web is held under mild tension, without wrinkling or buckling.

The pocket formed in the web by lifting the overfolded edge portions thereof is ideal for receiving a shirt dropped into the trough 54, and the arms 55 and 55*a* are adapted to refold said edge portions over the shirt and permit the web-embraced shirt to drop through the machine for sealing and cut-off operations to complete the bagging as hereinafter described.

The spreader arms 55 and 55*a* are carried by a subassembly of elements which are mounted upon a base plate 56 which lies immediately underneath the face plate 23 in a transverse, horizontal position, normal to the surface of the face plate 23. Suitable openings 57 are provided in the face plate 23 to permit the arms to project outwardly therefrom as illustrated in the drawing. Each arm 55 and 55*a* is mounted upon a pivot 58 carried on ears 59 and 59*a* respectively, projecting from the front edge of the base plate 56. The arm 55 is longer and the ear 59 extends somewhat further outwardly than does the opposing arm 55*a* and 59*a* and this permits an overlapping action of the arms when they close to overlap the edge 30 of the web 29, such action of the arms being illustrated in broken lines at FIG. 12.

An elongated, narrow U-bar, 60 and 60*a*, extends from the base of each arm 55 and 55*a*, with the outer leg of each U-bar being secured to the arm base carried by pivot 59 and the inner leg thereof being free to permit an edge of a web to be threaded onto and between the legs of the U-bar, 60 and 60*a*. Each spreader arm, 55 and 55*a*, also includes a short lever arm 61 opposite the U-bar and the end of each lever arm 61 is connected to a link 62 and each link is toggle-connected to an arm of a T-lever 63 with all connections being as by a pivot pin 64 and with the central leg of T-lever 63 being mounted on a pivot 65 centrally upstanding from the base 56.

Actuation of this toggled arrangement to move the arms 55 and 55*a* inwardly for overfolding the web edges is through a pull-bar 66 attached to a pivot 64 at one end of an arm of the T-lever 63. A solenoid 67 provides the power for such movement and its armature 67*a* is attached to the pull-bar 66. The solenoid 67 is mounted upon a ledge 68 upstanding from a rearward projection of the base 56. A tension spring 69 mounted on the ledge 68 opposes the solenoid and returns the toggle to its normal position, with the arms open, whenever the solenoid is deenergized. The spring is secured to the pivot 64 on the end of the arm of the T-lever 63 opposite the connection of the pull-bar 66 as by a clip 70.

The solenoid 67 is energized to close the arms 55 and 55*a* by a microswitch 71 at the underside of the face plate 23 below the trough. The switch 71 is normally open and is closed by movement of its finger 72 which extends upwardly through an opening 57*a* in the face plate and against the underside of a rocker bar 73 which is mounted transversely across the face plate 23. The rocker is swingably attached to the face plate by a weighted arm 74 at the top edge of each end thereof, and the arms are arranged to hold the rocker at an outward inclination of approximately 45 degrees from the surface of the face plate 23, as in the manner clearly illustrated at FIG. 7. A light force, such as a pull of the web moving past the rocker or the weight of a shirt, will depress rocker 73 to close the switch 71.

The edge portions of the web in the embrace of the U-bars, 60 and 60*a*, are positively held in the grip of the U-bars whenever they are outstanding from the face plate 23, but when the switch 71 is closed as by the weight of a shirt and the arms are overfolded, the grip of the U-bars is released to permit the shirt to fall through the trough pulling the web withit. The gripping of the web is by a spring-loaded finger 75 which is mounted on each pivot 58 below the mounting of the arms, 55 and 55*a*, to extend between the legs of each U-bar, 60 and 60*a*. Each finger is adapted to bear against the surface of the inner leg of its U-bar and a spring 76 is mounted on each arm 55 and 55*a*, as to a stud 77 to hold the finger 75 resiliently against the leg of its U-bar. A stub 78 projects from each finger adjacent its pivotal mount and this stub is adapted to move against a stop 79 upstanding from the base plate 56, the contact occurring when the arms 55 and

55*a* move inwardly to the overlapped position as indicated in broken lines at FIG. 12. In such overlapped position, the fingers 75 thereby release the web to permit its movement through the trough.

Other features of this sub-assembly include a stop 79*a* upstanding from the base 56 at a position suitable to contact with a lever arm 61 of the arm 55*a* to limit the extent of the opening of the arms to that illustrated in the drawing. To further assist in guiding the web and to hold down a shirt placed in the trough, a vertically disposed guide fin 80 is affixed to the inner side of the inner arm of each U-bar 60 and 60*a*.

The web-embraced shirt drops from the trough, down the inclined face 23, past a transversely disposed cut-off block 81 at the terminus of the face 23 and thence downwardly with the drop being checked in front of the front plate 22. The distance of the drop is determined by the length of web between the guide bars 37 and 39 meted out by the pay bar 38 in a previous cycle of operation. During this movement the rocker 73 remains depressed, first by the weight of the shirt and then by the tension of the web. As the shirt terminates its drop it also contacts an outstanding finger 82 of a control switch 83 which initiates the movement of a cut-off arm against the block 81 to seal and sever the web and release a bagged shirt having the end 32 closed where the web was severed; also, to form a new closed end 32*a* at the end of the web remaining in the machine for repetition of the operation.

This switch 83 is interconnected in series with a cut-out switch 84 and a motor 85 mounted within the body as on a platform 86. The drive shaft of this motor 85 is suitably gear-reduced for slow speed rotation and is mounted in spaced parallelism with the guide bars 37, 38 and 39. A crank 87 is carried on this shaft and is connected to the thrust arm 43, hereinbefore described, and to an opposing pull-arm 88 for operation of the cut-off arm.

The pull arm 88 is connected to a transversely disposed spacer bar 89 which rigidly interconnects a pair of rocker arms 90 which, in turn, extend through the frame 20 of the machine at each side of the face plate 23 to carry a transversely disposed head 91 and form the web cut-off arm. The rocker arms 90 are mounted to the frame member 20 as by pivots 92 and extend through the frame member in slots 93. A spring 94 is affixed to the inner end of each rocker arm and extends to a suitable frame member of the platform 86 to keep the system under tension and without slack when the crank 87 is rotating. For adjustment purposes in operation of the unit, both the thrust arm and the pull arm 88 may include turnbuckles 95.

The transverse cut-off head 91 carries a central, extended strip-like pressure pad 96 at its underside and a yieldable strip-like holding pad 97 at each side of the pad 96. The pad 96 is of a resilient, heat-resisting material and the pads 97 are of sponge rubber or like material and extend below the pad 96 for gripping the web before the pad 96 contacts it when the cut-off head moves against the web at block 81. A resistance wire 98 forms a heating element and the wire is held between posts 99 at each end of the head 91. The wire 98 lies along the center of the head spaced slightly from the pad 96 and a circuit wire 100 extends from the body of the unit and to the head 91 for connection with each end of the resistance wire 98 to provide current for heating it.

The block 81 against which this head moves is formed as a rectangular sectioned body 101 of a yieldable material such as sponge rubber with a more rigid protective facing strip 102 at its contact surface and with a centered head-resistant contact strip 103 on the facing strip against which the resistance wire 98 moves. This contact strip 103 is of a non-conductive non-adherable, heat-resistant material, for the substances forming the web 29 must not adhere to the strip when they are melted by the heat of the wire 98. Such material in common commercial use is known as Teflon.

For proper sequential operation of the apparatus, the switch 84 includes a contact finger 104 which is actuated by a cam 105 on the arm of the crank 87. The face of the cam 105 is limited in its extent to approximately 100 degrees of arc and is adapted to contact the finger 104 to close the switch 84.

The sequences of operation of this unit, as hereinbefore set forth, permit the web 29 to move from its roll 28 past the grounding fingers 35 for an initial separation and electrostatic neutralization of the folds thereof; thence, over the guide 37, under the pay bar 38, over the front guide bar 39 with the rocker frame 45 coacting with movement of the pay bar 38 to move selected lengths of web through the machine as it operates in a cyclic manner. Thence, the web extends into the trough 54 with the edge overfolds thereof being opened by arms 55 and 55*a* and thence below the trough with the edge portions being refolded and the end being sealed as at 32*a*. A shirt dropped into the trough and into the embrace of the web will initiate action of the switch 71 to close the arms 55 and 55*a*, release the web from the fingers 75, permit the shirt to drop below the block 81 and contact the switch 83 to initiate a cyclic operation of the motor 85 to move the cut-off head against the anvil 81 to sever the web and at the same time to depress the pay bar 38 to pay off another length of web for a subsequent shirt wrapping operation. The bagged shirt severed from the web will drop away from the machine to a ledge 106 and thence fall into a container 107 at the base of the machine.

The machine illustrated at FIGS. 16 and 17 is substantially that heretofore described, but includes a modification of the means adapted to receive the packaged shirt when severed from the web. A steeply inclined tray 108 is pivotally connected to the front wall 22 immediately below the anvil with the switch 83 affixed to the underside of the tray and with the finger 82 projecting into the tray. This tray is swingably affixed to the front wall 22 as by pivots 109 and is adapted to rock from an inclined shirt-receiving position as at FIG. 16 to a shirt-dropping position, as at FIG. 17. This tray movement is coordinated with the movements of other mechanisms hereinbefore described. An arm 110 outstands from the undersurface of the tray to extend into the body of the machine as through an opening 111 and it is connected to the spacer bar 89 by a link 112. The lengths of the arm 110 and the link 112 are such that the tray is inclined outwardly from the machine when the rocker arms 90 are in the up position and being such that the inclination is against the wall of the machine when the rocker arms move the cut-off head 91 down to contact the block 81 as illustrated at FIG. 17.

The circuit illustrated at FIG. 18 is representative of a circuit for operation of the elements hereinbefore described. A power source represented by the lead 113 and grounds 113*a* operates the several circuits. One independent circuit includes the resistance wire 98, the circuit wires 100, a switch 114 and a rheostat 115, the rheostat 115 being adjustable to control the temperature of the resistance wire 98.

Another circuit lead 116 includes the switch 71 and the solenoid 67. Another circuit 117 includes the switch 83, the switch 84 and the motor 85. A shunting circuit 118 is interposed between the circuits 116 and 117 between the switch 71 and solenoid 67 of the circuit 116 and between the switch 84 and motor 85 of the circuit 117.

The operation of these circuits commence with the dropping of a shirt into the trough, and switch 71 is first closed to operate solenoid 67. This switch 71 will remain closed as long as the shirt and web portion holding it remain attached to the body of web. Next, the shirt, upon completion of its drop, will contact the finger 82 to close the switch 83 to initiate rotation of the motor 85, the switch 84 being closed by cam 105. Movement of the motor and cam 105 however, will open switch 84 so that once the movement is started the motor is powered through circuit 116 and shunt 118. A closed motor cir-

cuit will continue until the web is severed by the head 91 when the packaged shirt drops from the web. At that instant the motor is turned off, but the inertia of the motor armature will continue the operation to a point where the cam 87 will return to its initial position for repetition of the cycle. An adjustment of the cam 105 and an adjustment of the contact mechanism of switch 84 can easily accomplish this for any given motor; however, conventional braking attachments may be used with the motor to force the motor to stop at any selected position.

While we have now described our invention in considerable detail, it is obvious that others skilled in the art can devise and build alternate and equivalent constructions which are nevertheless within the spirit and scope of our invention. Hence, we desire that our protection be limited, not by the illustrations and constructions herein described, but only by the proper scope of the appended claims.

We claim:

1. Apparatus for forming a bag for a shirt, or like article, from a longitudinally extended web of polyethylene or like sheet material, comprising in combination, means for guiding the web to a shirt receiving station, means at the receiving station for outwardly folding the longitudinally disposed side portions of the web from the plane of the central portion thereof to permit a shirt to be placed on the central portion of the web between the outfolded side portions, and for overfolding said side portions upon a shirt placed thereon, responsive to the placing of the shirt thereon, means for transversely sealing the overfolded web at each end of the shirt to form the bag and means for severing the bag from the web.

2. Apparatus for sequentially forming bags for shirts, or like articles from a longitudinally extended web of polyethylene or like sheet material comprising in combination, means for carrying a roll of the web, a shirt receiving station, a cut-off station adjacent to the shirt receiving station, means for guiding an end of the web from the roll and past the shirt receiving station, means at the receiving station for outwardly folding the longitudinally disposed side portions of the web from the plane of the central portion thereof to permit a shirt to be placed on the central portion of the web between the outfolded side portions, and for overfolding said side portions upon a shirt placed thereon, responsive to placing the shirt thereon, means adapted to permit movement of the shirt carrying portion of the web from the shirt receiving station and past the cut-off station, means responsive to moving the shirt containing web portion past the cut-off station adapted to transversely cut-off and to seal the overfolded side portions of the web against the central portion at both sides of the cut to thereby close the end of the severed shirt containing portion of the web to form a bag containing the shirt and to form a closed end of the unsevered portion of the web at the shirt receiving station adapted to permit the unsevered portion of the web to form a bag end to receive another shirt.

3. In the apparatus defined in claim 2, said overfolding means being adapted to lap one longitudinal edge of the web over the other longitudinal edge.

4. In the apparatus defined in claim 2, said severing means being correlated with said sealing means and being adapted to seal the bag at one side of the sever and seal the web end at the other side of the sever to partially form a bag at the end of the web.

5. In the apparatus defined in claim 4, said severing means including a transversely disposed heating element adapted to move against a contact block and to heat sever the web at contact and to heat-seal the overfolded portions of the web at each side of contact.

6. Apparatus for sequentially forming bags for shirts or like articles having shirts bagged therein, from a longitudinally extended web of polyethylene or like sheet material, comprising, in combination, a downwardly inclined shirt receiving-station and a cut-off station below the shirt-receiving station, means for guiding an end of the web downwardly to place a reach of the web upon the receiving station and for outfolding the longitudinally disposed side portions of the web reach from the plane of the web whereby to permit a shirt to be placed on the web reach between the outfolded side portions, means adapted to permit the reach to drop from the receiving station to the cut-off and to overfold said side portions upon a shirt placed on said reach, responsive to placing a shirt on the web reach, and means at the cut-off station adapted to transversely sever the web and to seal the overfolded web portions at each side of the sever whereby to release a bagged shirt at the cut-off station and to form a pocket in the overfolded end portion of the web adapted to hold a shirt placed on the next succeeding reach of the web.

7. In the apparatus defined in claim 6, means adapted to receive and stack bagged shirts as they are severed from the web.

8. In the apparatus defined in claim 6, means above the shirt receiving station adapted to hold the web and to sequentially pay out selected reach-lengths of web whereby to permit a shirt placed in the web end pocket to drop from the shirt receiving station to the cut-off station and be suspended at the cut-off station and to be suspended by the web until the severing operation.

9. In the apparatus defined in claim 6, said web entering the apparatus as a longitudinally extended strip having longitudinally disposed side portions overfolded upon the longitudinal central portion thereof with the longitudinal edges substantially abutting each other at the center of the web, and wherein said guiding and outfolding means includes a pair of spreader arms at said station adapted to lift the side portions of the web outwardly from the central portion but to return the side portions over the central portion responsive to placing a shirt upon the central portion of the web.

10. In the apparatus defined in claim 6, a guide trough at the shirt receiving station adapted to facilitate placing a shirt on the web.

11. Apparatus for sequentially forming shirt bags having shirts bagged therein, from a longitudinally extended web of polyethylene or like sheet material, comprising means for holding a roll of the web and guiding the same into the apparatus including a pair of spaced guide bars near the top of the apparatus over which the web moves to extend downwardly therefrom, pay-out means at the guide bars adapted to sequentially pay out selected reach-lengths of web for forming shirt bags and to hold the web while a bag is being formed, a downwardly sloping face plate against which the web moves to form a shirt receiving station, spreader arms at the shirt receiving station adapted to normally outfold the longitudinally disposed side portions of the web from the plane of the web but to overfold the side portions about a shirt placed on the web at said station, means adapted to release the end reach of the web with a shirt folded therein and to drop the shirt and end reach of the web to a position below the receiving station and means adapted to transversely sever the shirt enfolding end reach of the web at the base of the receiving station and to seal the overfolded severed edges of the web at each side of the sever whereby to release a bagged shirt and to partially form a bag on the next succeeding end reach of the web at the receiving station.

12. In the apparatus defined in claim 11, said pay-out means including a depressible pay-bar mounted between said guide bars, alternatively reacting brakes at the guide bars and means adapted to cyclically depress the pay bar with the brakes holding the web at the guide bar adjacent to the receiving station and releasing the web at the guide bar adjacent to the supply roll to pay off a selected web length from the roll, and to raise the pay bar with the brakes holding the web at the guide bar

adjacent to the roll and releasing the web at the guide bar adjacent to the receiving station to permit movement of the web from the receiving station for the severing operation.

13. In apparatus defined in claim 11, said spreader arms including holding fingers adapted to prevent movement of the web with the arms holding the web sides outwardly from the plane of the web but to release the web for longitudinal movement thereof when overfolded as upon a shirt.

14. In the apparatus defined in claim 13, said spreader arms being overlapped when being overfolded as upon a shirt whereby to lap one longitudinal web edge over the other.

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