FOLDER FOR OPTIONAL QUARTER FOLD OR FRENCH FOLD

Original Filed June 1, 1964

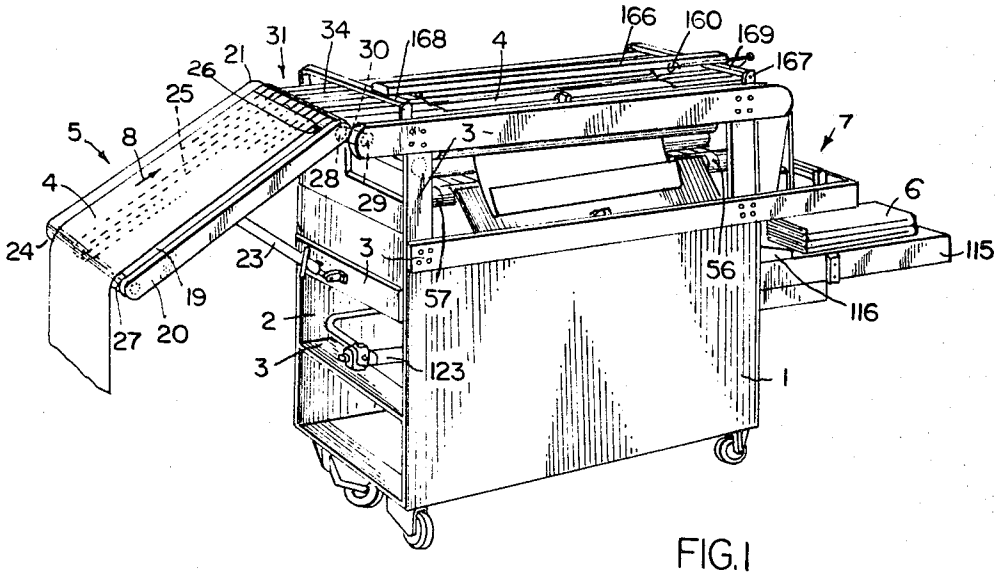


FIG. 1

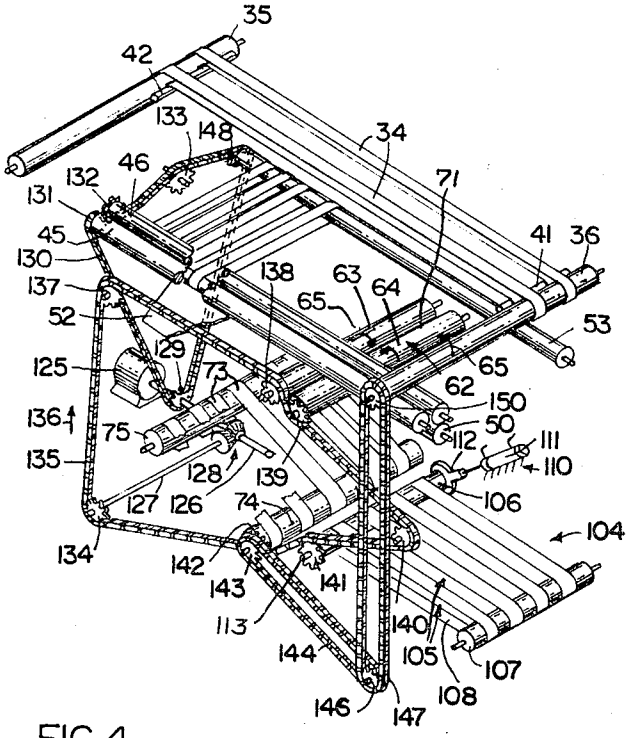


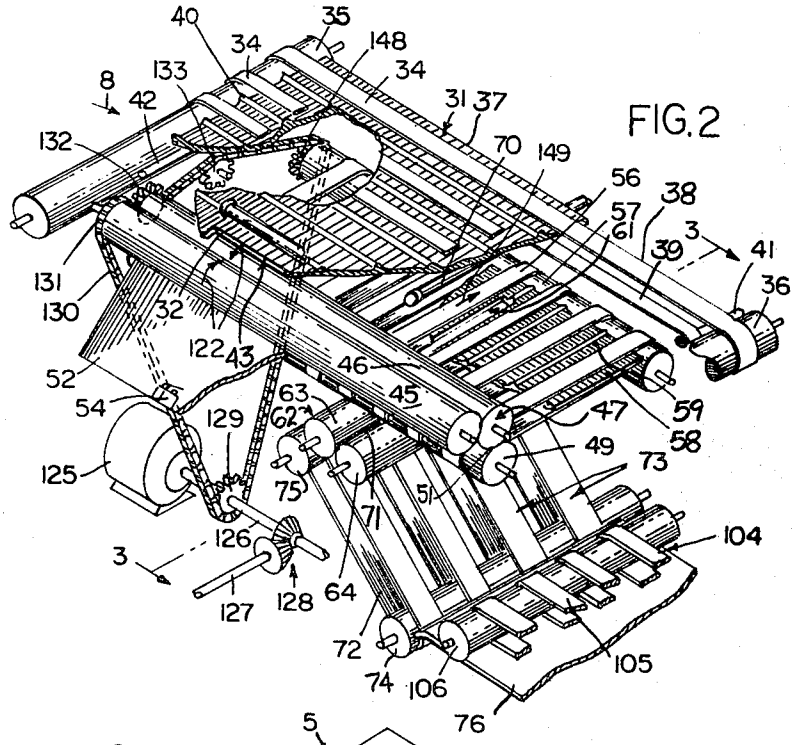
FIG. 4

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FIG. 2



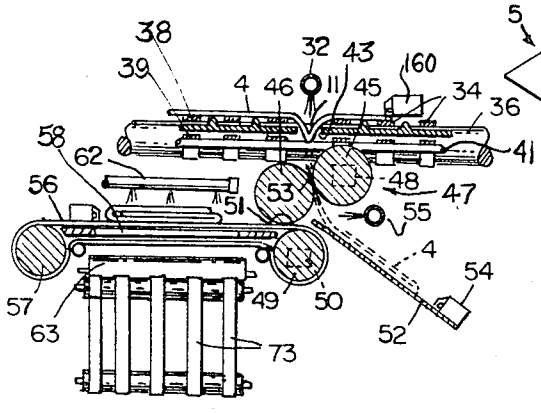


FIG. 3

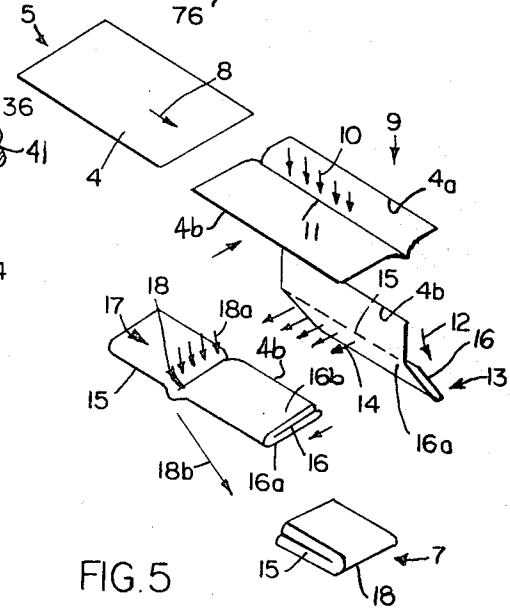


FIG. 5

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FOLDER FOR OPTIONAL QUARTER FOLD OR FRENCH FOLD

Original Filed June 1, 1964 Sheet 3 of 3

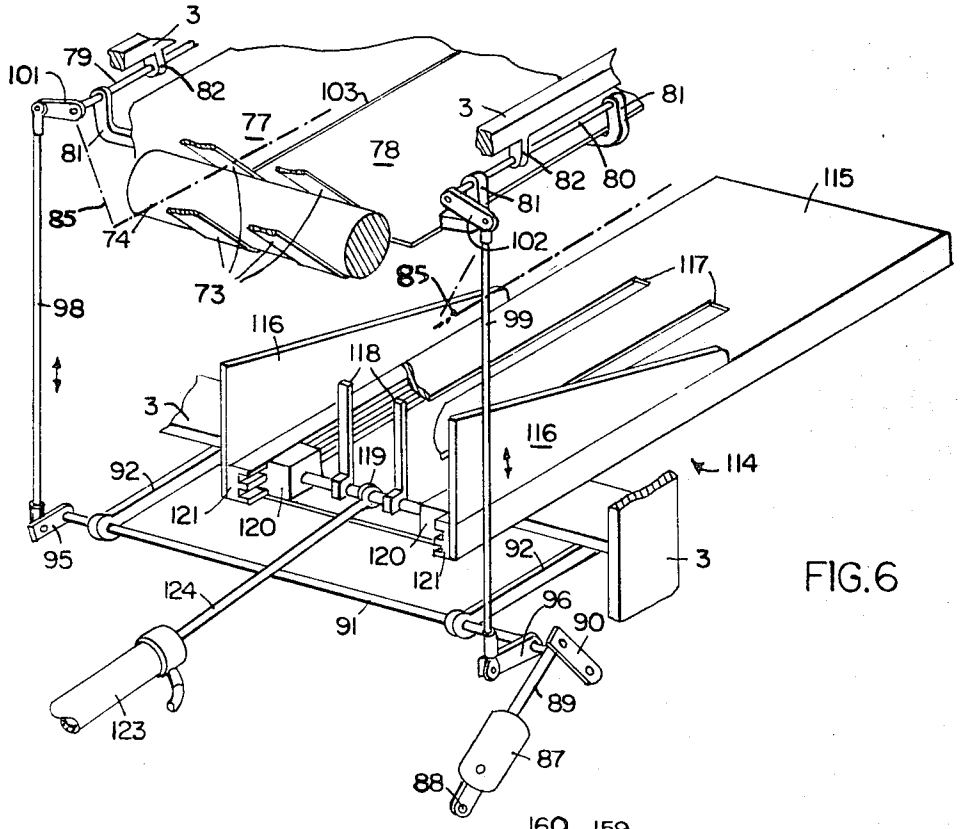


FIG.6

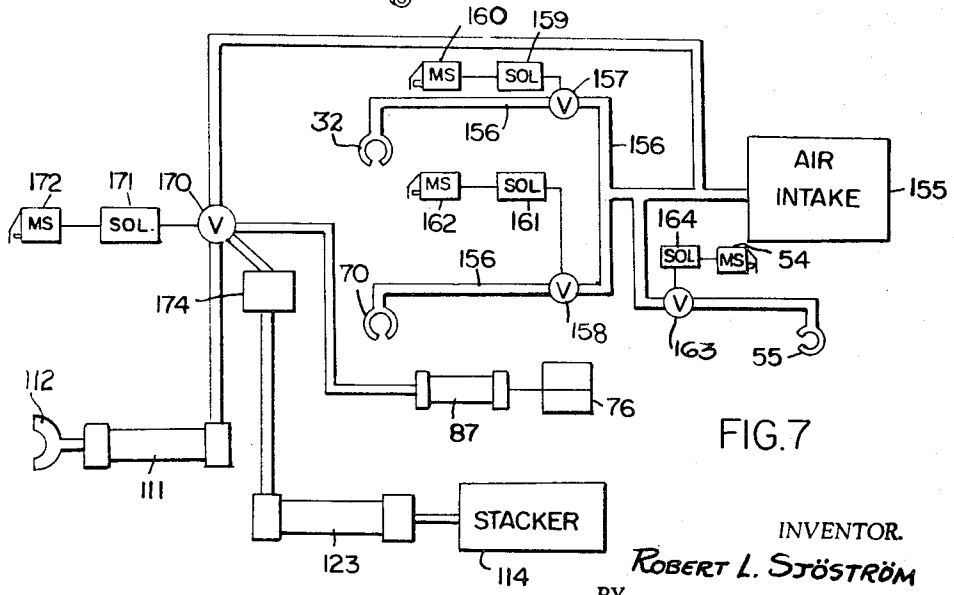


FIG.7

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3,419,261

FOLDER FOR OPTIONAL QUARTER FOLD OR FRENCH FOLD

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Continuation of application Ser. No. 373,601, June 1, 1964, which is a continuation-in-part of application Ser. No. 291,323, June 28, 1963. This application Sept. 12, 1966, Ser. No. 578,888
5 Claims. (Cl. 270—69)

ABSTRACT OF THE DISCLOSURE

A textile folding machine for successively folding flexible sheets with a French fold or, alternately, a quarter fold. A horizontally oriented, endless conveyor belt means carries successively fed sheets for folding over an opening between the longitudinally aligned with the belts of the endless conveyor. Means force a sheet downwardly between adjacent belts into a longitudinally extending three-roll, folding mechanism which successively effects parallel folds in the sheets. A twice-folded sheet is then carried to a transverse folding mechanism by another horizontally oriented conveyor means in which a cross fold is formed by forcing the folded sheet downwardly between the conveyor belts of the second conveyor means into the nip of a pair of folding rolls. A switch is provided to permit bypassing of one of the folding operations in the three-roll folding arrangement.

This application is a continuation of application Ser. No. 373,601, filed June 1, 1964, now abandoned, which in turn is a continuation-in-part of application Ser. No. 291,323 filed June 28, 1963, now abandoned, by applicant for an invention entitled Folder.

The present invention relates to a machine for folding successively delivered sheets.

In several industries, particularly the linen supply and laundry industries, there is a need for an improved machine that will accurately and efficiently fold sheets supplied to it in quick succession. In the linen supply industry, for example, it is customary to separately launder similarly sized articles such as napkins and towels. These articles are then fed successively by an operator to an ironer. After they are delivered from the ironer it is necessary to fold them and stack them for subsequent handling. While some attempts have been made to provide a machine that will receive and fold towels delivered from an ironer, such machines have been relatively expensive, subject to frequent and expensive maintenance and repair and incapable of accurately folding articles as napkins and towels. In addition these machines are often incapable of receiving and folding articles at the rate at which they are delivered from the ironer machine.

It is an object of the present invention to provide a machine for folding flexible articles and preferably textile articles such as napkins and towels efficiently and accurately. It is also an object of the present invention to provide a relatively inexpensive, but efficient and rugged machine for folding flexible articles, which requires little maintenance or attendance during operation. A further object of this invention is to provide a folding machine particularly useful in connection with laundry and linen supply operations, which is adapted to fold and uniformly stack flat flexible articles successively delivered to it. One further object of this invention is to provide a machine which is adapted to multiple fold rectangular articles such as sheets, napkins, towels, and the like, and thereafter

form successive stacks of the folded articles in preselected number. It is also an object of this invention to provide a machine which can be readily used for quarter folding articles or for French folding articles with such machine adapted to be readily converted from one use to the other.

The invention is primarily a mechanical device that has a minimum number of electrical components and may be made without the use of vacuum or phototubes, transistors or complex electronic circuitry.

A pair of conveyor means, each preferably comprising endless belts, are arranged in horizontal planes and extend angularly to each other. These conveyor means are adapted to move articles such as sheets, napkins or towels, successively in two directions, one preferably normal to the other. A folding means adapted to effect at least one, and if desirable, a plurality of folds is positioned intermediate the pair of conveyor means. This folding means preferably includes three parallel nip rolls positioned with their axes longitudinal with respect to the direction of movement of articles on the first conveyor means. Two of these nip rolls are arranged side by side and the third nip roll is arranged below one of the first two mentioned nip rolls, with the side by side nip rolls defining an upwardly facing folding means and one of the first together with the third nip roll defining a horizontally facing folding means. Means are provided for directing articles on the first conveyor means downwardly along a line longitudinal of the direction of movement of the article into the upwardly facing folding means. Means are also provided for directing the article as it is passing through or just after it has passed from the upwardly facing folding means, laterally into the horizontally facing folding means, from whence the article is conveyed onto the second conveyor means. Another folding means is positioned directly beneath the second conveyor means, and is adapted to receive the already folded article as it is carried on the second conveyor means, and effect a further fold along a line angular to the fold or folds already effected by the three nip rollers. Means are also provided for stacking successively folded articles into accurate and even stacks of preselected numbers.

These and other objects and advantages of the present invention will be more clearly understood when considered in conjunction with the accompanying drawings in which:

FIG. 1 is a perspective view of a preferred embodiment of the invention;

FIG. 2 is a fragmentary perspective view illustrating certain rolls and a portion of the drive mechanism therefor;

FIG. 3 is a somewhat schematic view of the rolls shown in FIG. 2 and taken substantially along the line 3—3 of FIG. 2;

FIG. 4 is a fragmentary perspective view illustrating various portions of the conveyor means and drives therefor;

FIG. 5 is a perspective schematic view illustrating the method and sequence of folding;

FIG. 6 is a fragmentary perspective view of portions of the delivery end and

FIG. 7 is a schematic illustration of a portion of the actuating mechanisms.

The embodiment of the invention illustrated in FIGS. 1 to 7 is designed primarily for folding textile articles such as towels, napkins and sheets, and is particularly useful in the linen supply and laundry industries for folding ironer or flat articles delivered from a suitable source, such for example as a commercial ironer. The principles of this invention may be embodied in a machine which will French and/or quarter fold such articles. In addition, this invention may be embodied in machines useful

for other purposes and in other industries wherever it is desirable to successively fold flexible sheet materials.

Referring to FIG. 1 there is provided a machine having a frame which includes side panels **1** and **2** and various vertically transversely and longitudinally extending frames or beams **3**, suitably secured together and located to support various elements hereinafter described. Articles **4** are successively placed in flat form, as illustrated in FIG. 1, at the receiving or rear end **5** of the machine, and after successively folding the articles, preferably into a French folded form in the machine, the articles are delivered in stacks **6** at the delivery or forward end **7**.

The construction of the machine will be best understood from a preliminary consideration of the folding sequence effected on articles **4** passing through it. The folding sequence for effecting French folds is illustrated in FIG. 5. An article **4** fed into the rear end **5** moves forwardly in the direction of arrow **8**. At a preselected position **9** the article is forced downwardly in the direction of arrows **10** along line **11** longitudinal of the direction of forward movement illustrated by arrow **8**. This effects a first fold in the article **4**. Preferably, line **11** is parallel and closer to one side **4***a* of the forwardly moving article **4** than the other or opposite side **4***b*. After the first fold is formed along line **11** the article drops downwardly and preferably laterally as illustrated by arrow **12**. At a second position **13** the article **4** is forced laterally in the direction of arrows **14** along a line **15** which is preferably parallel to line **11**. Line **15** thereby defines the edge of a second fold parallel to the first defined by line **11**. As the article **4** moves in the direction of arrows **14**, one panel **16** of the article formed between side edges **4***a* and fold **11** is positioned over the center panel **16***a* defined between the fold line **11** and fold line **15**. As the article continues to move in the direction of arrows **14** the third panel **16***b* defined by fold line **15** and side edge **4***b* folds downwardly onto the panel **16** to effect a French fold at a position **17**. The French folded article is then transversely folded along a line **18** normal to the lines **11** and **15** by forcing the article **4** downwardly in the direction of arrows **18***a*. The article **4** is then carried downwardly and forwardly in a direction indicated by the arrow **18***b* with the line **18** defining a leading edge. The French folded article is then delivered to a position for stacking at the forward end **7** of the machine.

While FIG. 5 illustrates a folding sequence for French folding, the same machine may be adapted for effecting quarter folds. When a machine embodying the invention is arranged for quarter folding, the article **4** is fed to the preselected position **9** in the manner described above. The first fold is effected along the line **11** symmetrical with respect to the side edges **4***a* and **4***b* of the article. The article then drops downwardly in the direction of arrow **12** and is moved laterally to the position indicated at **17** without effecting the fold along line **15**. In this lateral movement the article **4** moves in the direction of arrows **14** with side edge **4***a* forming a leading edge. In the position indicated at **17**, the transverse fold along the line **18** is then effected and the twice folded article is delivered to forward end **7** of the machine in the manner described above.

Referring now to FIG. 1, there is shown a conveyor means **19** at the rear end **5**. The conveyor means **19** is supported on the frame **20** which in turn pivotable about its forward end **21** in turn suitably secured to beams **3**. This frame **20** may be adjustably secured at different angular positions by suitable means which may comprise a conventional lockable telescopic support **23**, suitably pivotably secured at one end to a beam **3** and at the other end to the lower portion of the frame **20** (not shown). The conveyor means **19** may be adjustable so that the rear end **24** can be aligned with the delivery end of an ironer or some other suitable mechanism. The conveyor means comprises a plurality of endless webs or belts **25** supported for rotation with their upper surfaces adapted to move in the forward direction of arrow **8**. These webs **25** are mounted on rolls **26** and **27** in turn respectively journaled in the frame **21**. The shaft on which roll **26** is mounted carries a sprocket **28** which is operatively coupled to a sprocket **29** by chain **30** so that actuation of sprocket **29** in a clockwise direction as viewed in FIG. 1 will cause movement of the webs **25** in the direction indicated by arrow **8**.

A conveyor means **31** is positioned in the upper portion of the machine and is adapted to receive articles **4** from the conveyor means **19** and carry the articles successively in the forward direction of arrow **8**. The conveyor means **31** is best illustrated in FIGS. 2 and 3 and includes a plurality of parallel horizontally disposed endless webs or belts **34**, arranged longitudinally of the machine and supported by forward and rear rolls **36** and **35** respectively. Rolls **36** and **35** are in turn suitably supported for rotation in journals fixed to bears **3**. A support plate **37** is positioned intermediate the upper and lower portions **38** and **39** of the belts **34**. This plate **37** is provided with a plurality of longitudinally extending ridges **40** which project between and above the upper portions **38** of webs **34**. The plate **37** provides support means for the upper portions **38** of the belts **34**, and the ridges **40** provide rail-like supports for articles **4** with minimum frictional retardation as such articles are carried forward by the belts **34**. The lower portion **39** of the belts **34** are positioned below the support plate **37** and pass over idler rolls **41** and **42**, with the idler rolls suitably journaled and supported on beams **3**. A longitudinally extending rectangular opening **43** is formed preferably closer to one side of the plate **37** than the other with the opening extending betwen a pair of adjacent belts **34** and directly over rolls **45** and **46** of the first folding means **47**. In the preferred form, the opening **43** in plate **27** which extends across the width of the machine, is located one third the width of the machine from the right side as viewed in FIG. 2. Positioned directly below the opening **43** and extending longitudinally of the belts **34** are first folding rolls **45** and **46**. These rolls are journaled on beams **3** extending transverse thereto. Roll **45** is journaled on thrust bearings **48** at either end with its axis positioned in a plane higher than the axis of roll **46**. Roll **45** is tensioned by the thrust bearings **48** towards tangential engagement with roll **46** which is secured in fixed bearings supported on the frame thereby defining the line of tangency **53**. Rolls **45** and **46** are preferably rubber covered to afford greater frictional engagement with articles passing therebetween. Roll **49** is positioned below roll **46** and is supported in thrust bearings **50** which spring tension the roll **49** upwardly toward tangential engagement with roll **46** defining therebetween a horizontally extending line of tangency **51**. Roll **49** is preferably offset from the plane passing vertically through the axis of roll **46**, slightly towards rolls **45**. An inclined plate **52** is supported on the frame **3** by suitable means and extends longitudinally of and preferably co-extensive with rolls **45**, **46** and **49**. The upper edge of the plate **52** is positioned adjacent roll **49** close to the line of tangency **51** and extends toward roll **46** with a portion of the plane **52** near its upper edge extending directly below the line of tangency **53** defined by rolls **45** and **46**.

Rolls **45**, **46** and **49** form a portion of the first folding means **47**. In addition, there is provided an air tube **32** having perforations longitudinally aligned with the line of substantial tangency and adapted to permit air under pressure in the air tube **32** to blow downwardly and force articles **4** on the conveyor means **31** downwardly between the nip rolls **45** and **46** along the line **11** to effect a first fold. Articles **4** which are projected downwardly between rolls **45** and **46** by air blasts from tube **32** will be directed onto plate **52** near the upper edge and will slide downwardly on the surface of plate **52**.

A microswitch 54 is positioned preferably at a central location along the lower edge of the plate 52. The microswitch is adapted to be tripped by the leading edges of articles 4 sliding down the plate 52. This microswitch is supported on the frame by any suitable means which preferably includes means for adjustably positioning microswitch 54 at selected distances from the upper edge of the plate 52, so that the distance that articles may slide down the plate 54 before they engage and trip the microswitch 54 may be adjusted. Microswitch 54 controls and times air blasts from air tube 55 by means hereafter described. Thus air blasts from tube 55 may be varied in timing by adjusting the position of microswitch 54. By moving it farther from rolls 45, 46 a greater time period will elapse before it is tripped by articles moving from between the rolls 45, 46. The air blast tube 55 is supported below roll 45 and is preferably longitudinally coextensive with it. This air blast tube is provided with a series of perforations along its length which direct the passage of air from the tube 55 towards the line of tangency 51 defined by rolls 46 and 49. The air tube 55, when actuated by means hereafter described, directs a blast of air such that articles 4 passing from between rolls 45 and 46 will be blown along the line 15 towards the line of tangency 51.

A plurality of parallel endless webs or belts 56 extend about or encircle rolls 49 and 57. Roll 57 is parallel to roll 49 and the belts 56 are preferably normal to belts 34. Roll 57 is suitably supported in journals on the frame 3 for rotation. A second support plate 58 is positioned between the upper and lower portions of belt 56. This second support plate supports the upper portion of belt 56 and is provided with a plurality of ridges 59 which extend transversely to the length of the machine between the upper and lower portions of belt 56 with the ridges projecting upwardly above the upper surface of these belts in a manner similar to ridges 40 in respect to belts 34. The second support plate 58 is provided with a rectangular opening 61 extending parallel to and intermediate the flat upper and lower portions of belts 56. A third folding means 62 includes a pair of parallel rolls 63 and 64 which are positioned with their axes parallel to the direction of movement of the upper portions of belts 56 and transverse of the machine. The rolls 63 and 64 are journaled and suitably supported on beams 3 for rotation towards one another in a direction indicated by arrows 65 (FIG. 4). These rolls are positioned directly below the opening 61 with the rolls substantially tangent to one another and with the line of substantial tangency 71 preferably symmetrical with opening 61. An air tube 70 having a line of perforations is positioned above the opening 61 with the line of perforations directed downward and in alignment with the line of tangency 71 of rolls 63 and 64.

Positioned below rolls 63 and 74 is a lower conveyor means 72. This lower conveyor means comprises a plurality of endless belts or webs 73 which are carried and driven by parallel rolls 74 and 75 (see FIG. 4). The rolls 74 and 75 are suitably journaled for rotation on their axis in the frame 3 with the rolls 74 and 75 parallel to rolls 63 and 64 whereby belts 73 are normal to the axes of rolls 63 and 64. Roll 74 is positioned with its axis in a plane lower than the axis of roll 75. Roll 75 is positioned rearwardly of roll 63 and roll 74 is positioned forwardly of roll 64. Articles delivered with the second fold effected between rolls 63 and 64 drop onto the downwardly and forwardly moving upper surface of belts 73.

Articles moving from the forward end of belts 73 are delivered onto the rear edge of platform 76 illustrated in FIG. 6. Platform 76 is formed of two sections 77 and 78 respectively secured to shafts 79 and 80 by a series of brackets 81. The shafts in turn are journaled longitudinally of the machine in journals 82 in turn secured to the beams 3. The platform sections 77 and 78 are supported for pivoting rotation between the normal position illustrated in FIG. 6 and the open or dotted position illustrated at 85. The platforms are operatively controlled for this pivoting movement by a hydraulic air cylinder 87 which is supported on the frame at one end by a pin 88 which permits the cylinder to rotate over a limited arc. The shaft 89 of the air cylinder projects from the other end and is pivotally connected to a lever 90 which in turn is secured at its other end to the shaft 91. The shaft 91 extends transversely of the machine and is suitably supported in journals formed in mounts 92. The shaft 91 is adapted to be rotated in either direction on actuation of the air cylinder 87. This shaft has secured to it a pair of levers 95 and 96, which in turn are connected by the links 98 and 99 to levers 101 and 102 respectively. Levers 101 and 102 are in turn connected to the shafts 79 and 80. Rotation of the shaft 91 causes levers 95 and 96 to rotate correspondingly. These levers 95 and 96 in turn cause pivoting of levers 101 and 102 through the links 98 and 99 and thereby control the opening and closing of the sections 77 and 78 of the platform 76 along the center line 103.

Articles 4 delivered from the end of the belts 73 of the lower conveyor means onto the rear edge of the platform 76 are engaged and carried forwardly by the conveyor means 104 (FIG. 4). This conveyor means includes a plurality of longitudinally extending parallel belts or webs 105 which encircle the parallel rolls 106 and 107. The lower section 108 of the belts 105 lies parallel to and adjacent the platform 76 when it is in its normal position. Therefore articles passing onto the platform 76 are carried forwardly by frictional engagement of the sections 108 of the belts 105 to a preselected position at which point the conveyor means 104 is momentarily stopped and the platform opened on line 103 from the position shown in solid to the position shown in dotted outline, thereby permitting the twice folded article to fall downwardly into the stacking mechanism (FIG. 6). The conveyor means is momentarily stopped by a brake and clutch mechanism 110 (FIG. 4). In this brake mechanism, an air cylinder 111 is suitably supported on a beam 3 and is connected to a friction clutch 112 adapted to engage and stop rotation of roll 106 about its shaft 113 momentarily. It has been found useful to momentarily stop the conveyor means 104 just prior to or as the platform 76 opens to assure a uniform stacking of articles on the stacker below.

The stacker or stacking mechanism 114 is best illustrated in FIG. 6. This stacker 114 includes a longitudinally extending chute 115 preferably having side walls 116. The stacker is positioned with its rear end directly below the platform 76 and is adapted to receive articles falling downwardly when the sections 77 and 78 of the stacker are opened so that the articles will fall directly one on top of another until a pile of a selected number is accumulated. When a preselected number of articles have been stacked in a pile, the pile is moved forwardly toward the end of the chute 115 where the pile may be removed by an operator. In this arrangement the chute 115 is provided with a pair of elongated openings 117 which extend from the rear end of the chute 115. A pair of fingers 118 extend upwardly through these openings. These fingers 118 are carried on a transverse shaft 119 in turn supported at either end by sliding carriages 120. The carriages are adapted to be moved forwardly and rearwardly in channels 121 which extend longitudinally of the chute 115 at either side. The shaft 124 of the hydraulic cylinder 123 is connected to the shaft 119 so that movement of the shaft 124 on actuation of the cylinder 123 will cause forward and rearward movement of the fingers 118 at selected intervals. The hydraulic cylinder 123 is in turn suitably supported on the frame 3.

The drive mechanism for the various components and rollers is best illustrated in FIGS. 2 and 4. In this arrangement a motor 125 suitably mounted on the frame

rotates shaft **126** in a clockwise direction as viewed in FIG. 2. A shaft **127** normal to shaft **126** is operatively engaged with shaft **126** for rotation therewith through the bevel gears **128**.

Shaft **127**, suitably supported for rotation on the frame, has a sprocket **134** mounted on it. Rotation of the shaft **127** and the sprocket **134** drives the endless chain **135** in a clockwise direction illustrated by the arrow **136**. The chain **135** encircles sprocket **137**, **138**, **134**, **140** and **142** and engages sprockets **139** and **141**. Sprockets **137** and **140** are idler sprockets suitably supported on the frame. Sprockets **138** and **139** are mounted respectively on rolls **63** and **64** and the chain **135** passes between these sprockets engaging sprocket **138** on the inside of the chain and sprocket **139** on the outside of the chain. Sprocket **141** is secured to roll **106** while sprocket **142** is secured to roll **74**. The chain **135** passes between these sprockets **141** and **142** engaging sprocket **141** on the outside of the chain and sprocket **142** on the inside of the chain. Rotation of the chain in the direction of arrow **136** thereby causes rolls **63** and **64** to move in the direction of arrow **65** (FIG. 4), belts **73** to move in a clockwise direction with the upper surface moving forwardly and belts **105** in a counterclockwise direction with the lower section **108** moving forwardly. Also connected to the shaft supporting sprocket **142** is a second sprocket **143** which engages the chain **144**. This chain **144** in turn engages a double sprocket **146** suitably secured to the frame. Sprocket **146** engages chain **147** which extends upwardly and encircles sprocket **150** mounted on roll **36**. This chain arrangement causes the roll **36** to rotate in a clockwise direction as viewed in FIG. 4, thereby moving the upper portion **38** of the belts **34** forwardly.

A sprocket **129** (FIG. 2) is secured to shaft **126**. This sprocket **129** drives the endless chain **130** and engages, in addition to sprocket **129**, the sprockets **131**, **132**, **133** and **148**. Sprocket **131** is secured to roll **45**, sprocket **132** is secured to roll **46**, sprocket **133** is secured to an idler roll and sprocket **148** is secured to roll **57**. The chain **130** encircles sprocket **131** and passes between it and sprocket **132**. It also encircles the sprockets **133** and **148**. On rotation of the chain in a clockwise direction as viewed in FIG. 2, rolls **45** and **46** rotate toward each other in the direction of arrows **122**, while roll **57** is rotated in a clockwise direction and thereby carries with it the belts **56** which also rotate in a clockwise direction as indicated by the arrow **149**.

A schematic arrangement of a suitable means for actuating the various elements described is illustrated in FIG. 7. In this arrangement, air to the air tube **32**, air tube **55**, and air tube **70** is supplied from air intake source **155** through pipes **156** with valves **157**, **163**, and **158**, controlling respectively the emission of the air blasts through tubes **32**, **55** and **70**. Valve **157** is actuated to permit an air blast through the tube **32** by means of a solenoid **159** in turn electrically controlled and actuated by a microswitch **160**. Valve **163** is operatively controlled by solenoid **164** in turn actuated by microswitch **54**. Valve **158** is operatively controlled by solenoid **161** in turn actuated by microswitch **162**. Microswitch **160** is supported on longitudinal extending beam **166** in turn supported at its ends on cross braces **167** and **168** (FIG. 1). Microswitch **160** has its actuating finger extending downwardly and adapted to successively engage the leading edge of articles **4** as they are carried forwardly on the belts **34**. The specific location of the microswitch **160** may be longitudinally adjusted by sliding it lengthwise on the beam **166** using handle **169** which is connected to the microswitch. Microswitch **54** is supported on a beam in a manner as previously described and is adapted to engage the leading edge of articles **4** after they are passed between rolls **45** and **46** and are sliding downwardly on plate **52**. The microswitch should be adjusted in a position with respect to the rolls **45** and **46** so that the trailing edge of the article lies intermediate air blast tube **55** and line of tangency **51** when the microswitch is tripped to actuate solenoid **164** and thereby permit a blast of air from tube **55**. By selectively positioning microswitch **54** the fold line **15** may be adjusted to occur at any selected transverse position in the article **4**. If it is desired to merely quarter fold rather than French fold articles, the normally open switch **200** in FIG. 7 is closed so that microswitch **160** in addition to controlling solenoid **159** will also control solenoid **164**. With the switch in a closed position articles are fed onto the belts **34** so that they will pass symmetrically over the rolls **45** and **46**. When the air blast from the air tube **32** projects them downwardly between rolls **45** and **46** they will be symmetrically folded along the line **11**. As the symmetrically folded article **4** passes between the rolls **45** and **46** air tube **55** is already in operation and blows the once folded article continually against roll **46** which continues to rotate and carry the once folded article with the folded edge foremost between roll **46** and roll **49** with the once folded article thereby being carried onto belt **56** without effecting a fold between rolls **46** and **49**. Microswitch **162** is suitably positioned above opening **61** (FIG. 3) with its actuating finger projecting downwardly and adapted to engage folded articles passing over opening **61**. Upon actuation microswitch **162** is adapted to open vlave **158** to cause air to pass through the tube **70** blowing an article on the belts **56** downwardly between rollers **63** and **64**.

A valve **170** also controls air from the air intake source **155** and actuates cylinders **111**, **123** and **87** which in turn respectively actuate brake **112**, stacker **114**, and platform **76**. Valve **170** is controlled by solenoid **171** in turn actuated by the microswitch **172**. Microswitch **172** is positioned intermediate belts **105** of the conveyor means **104** at the forward end and is adapted to be actuated by a forwardly moving article **4** as it is passed between belts **105** and platform **76**. Actuation of microswitch **172** causes the opening of valve **170** in a selective sequence. Valve **170** is adapted to first actuate air cylinder **111** which causes brake **112** to stop the rotation of roll **106** momentarily. At the same time or shortly thereafter, valve **170** actuates air cylinder **87**. When air cylinder **87** is actuated the leverage system described in connection with FIG. 6 causes the platform **78** to open thereby permitting the article carried forwardly between the platform **78** and the belts **105** to drop downwardly onto the chute **115**. When a preselected number of articles have piled up in a uniform stack on chute **115** just forward of fingers **118**, a suitable mechanism causes valve **170** or a secondary valve system to actuate air cylinder **123** which in turn causes fingers **118** to move forward and towards the forward end of the chute **115**. Any suitable control mechanism and valve system may be used to periodically or cyclically actuate air cylinder **123** and may for example, include a stepping relay and secondary solenoid adapted to actuate a valve which permits cyclical passage of air through valve **170** and into air cylinder **123**. Such a general arrangement is illustrated schematically at **174**.

Having now described my invention, I claim:

1. In a folding machine for a flexible sheet having three parallel rolls for effecting a plurality of parallel folds in a sheet, the combination comprising:

means supporting said rolls with one intermediate the other two and forming therewith two lines of substantial tangency toward which a moving sheet may be forced to successively effect folds between said rolls,

a pair of means each for effecting a positive force on said sheet toward a different one of said lines of tangency, a separate means for actuating each of said pair of means, and switch means associated with said separate means for simultaneously actuating said pair of means whereby a sheet folded at one of said lines of tangency will be guided by the positive

force toward the other line of tangency without being folded a second time.

2. A mechanism as set forth in claim 1 wherein each of said pair of means comprises an air blast pipe positioned parallel with and adapted to emit air toward a line of tangency.

3. A mechanism as set forth in claim 2 wherein said actuating means each comprises a switch having a finger adapted to be engaged by a sheet and controlling valve means for said air blast pipe.

4. A mechanism as set forth in claim 3 wherein said actuating means includes switch means for actuating with air pipes simultaneously.

5. In a folding machine for folding flexible sheets:

a first set of cooperative means for longitudinally folding said sheets twice into three parallel panels including three parallel rolls adjacent each other and forming a pair of lines of tangency, and means for successively directing sheets along lines intermediate their ends to said lines of tangency,

a second set of cooperative means including at least a pair of said parallel rolls forming one of said lines of tangency and one of said means for successively directing sheets toward said one of said lines of tangency for quarter folding said sheets,

and means for selectively activating one of said sets and deactivating the other of said sets.

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