June 10, 1958 W. V. BOWMAN ET AL 2,838,217

METHOD OF FINISHING KNITTED ARTICLES

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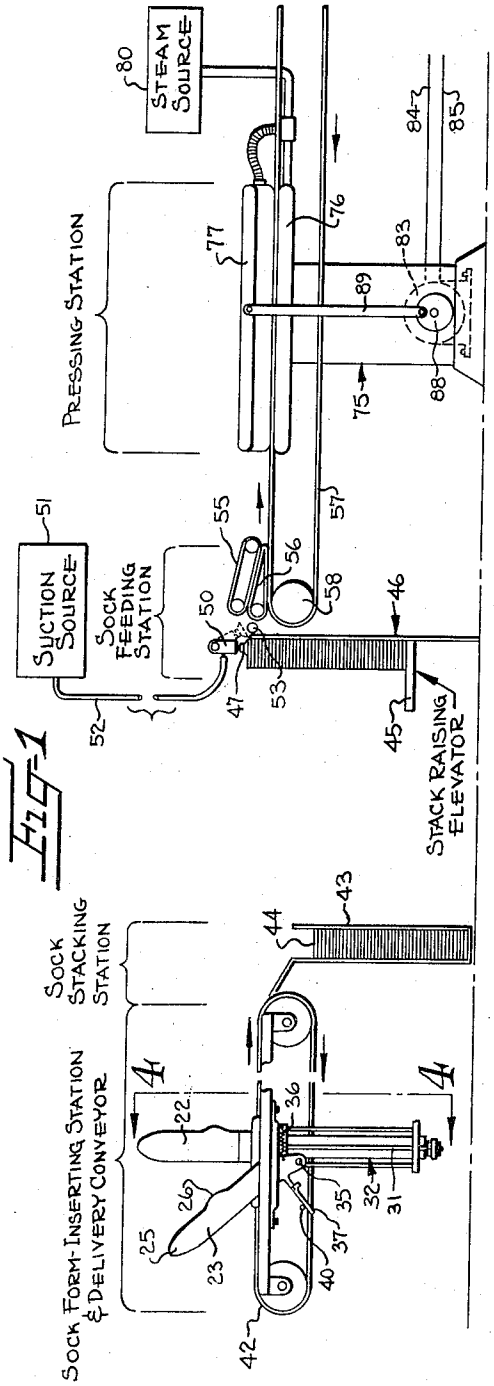


FIG-1

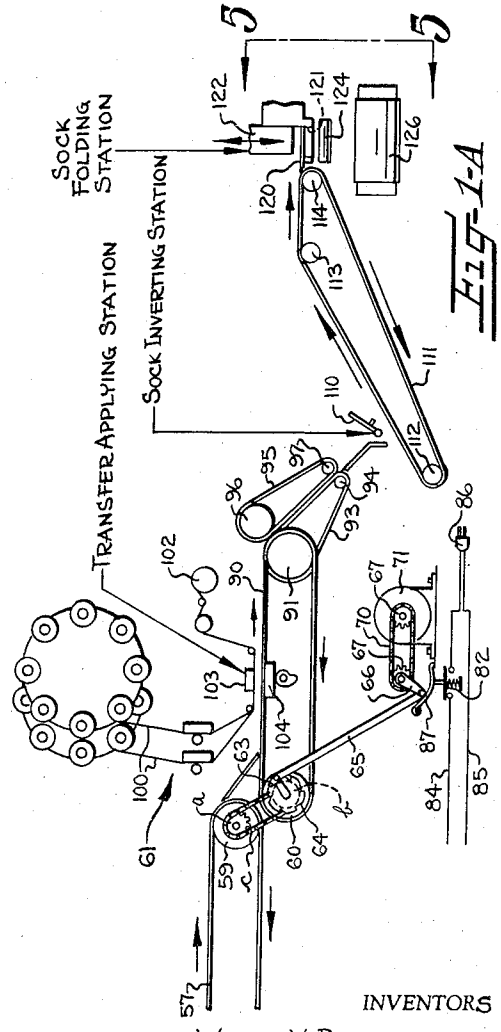


FIG-1-A

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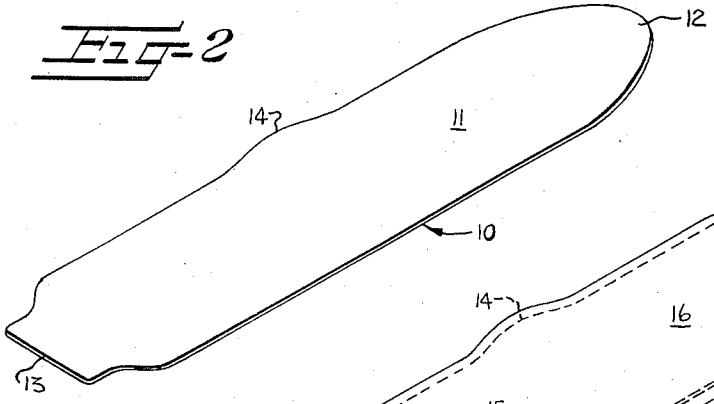
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METHOD OF FINISHING KNITTED ARTICLES

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Fig-2



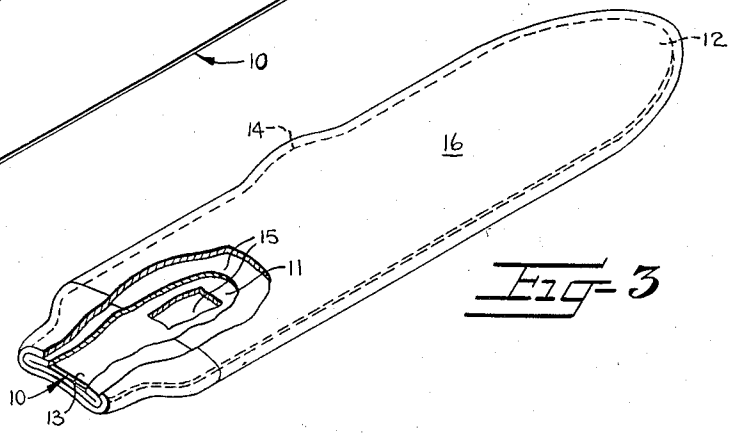


Fig-3

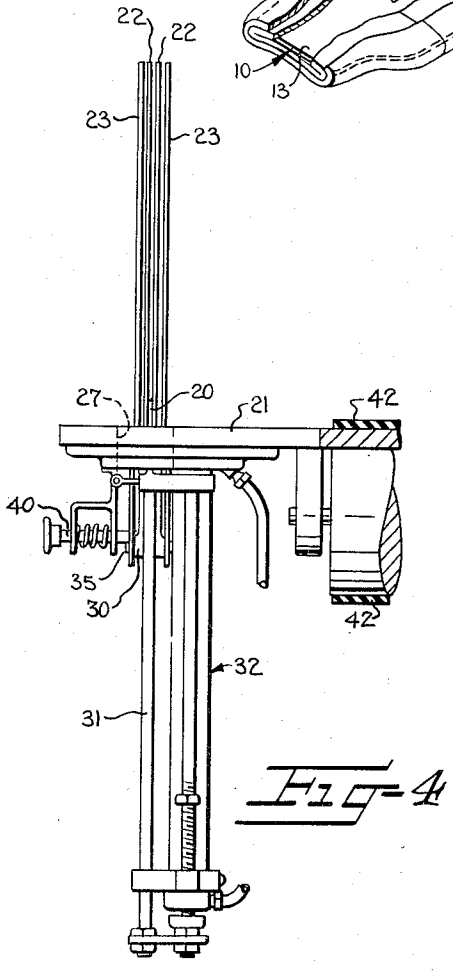


Fig-4

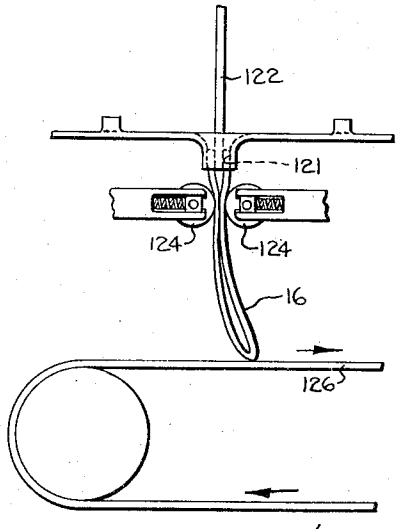


Fig-5

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METHOD OF FINISHING KNITTED ARTICLES

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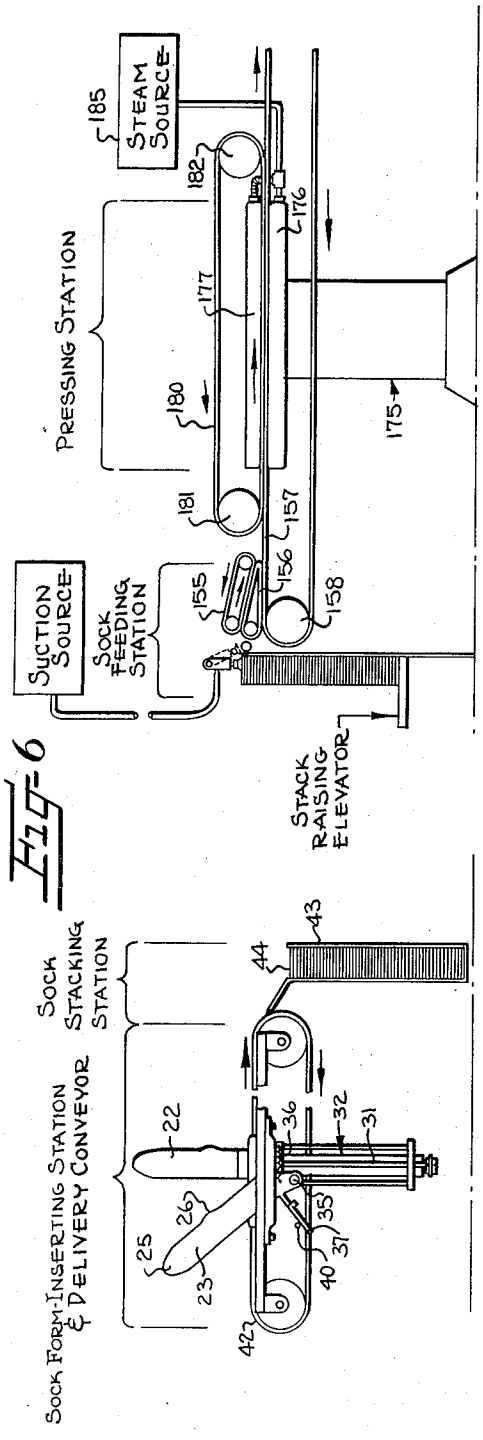


Fig. 6

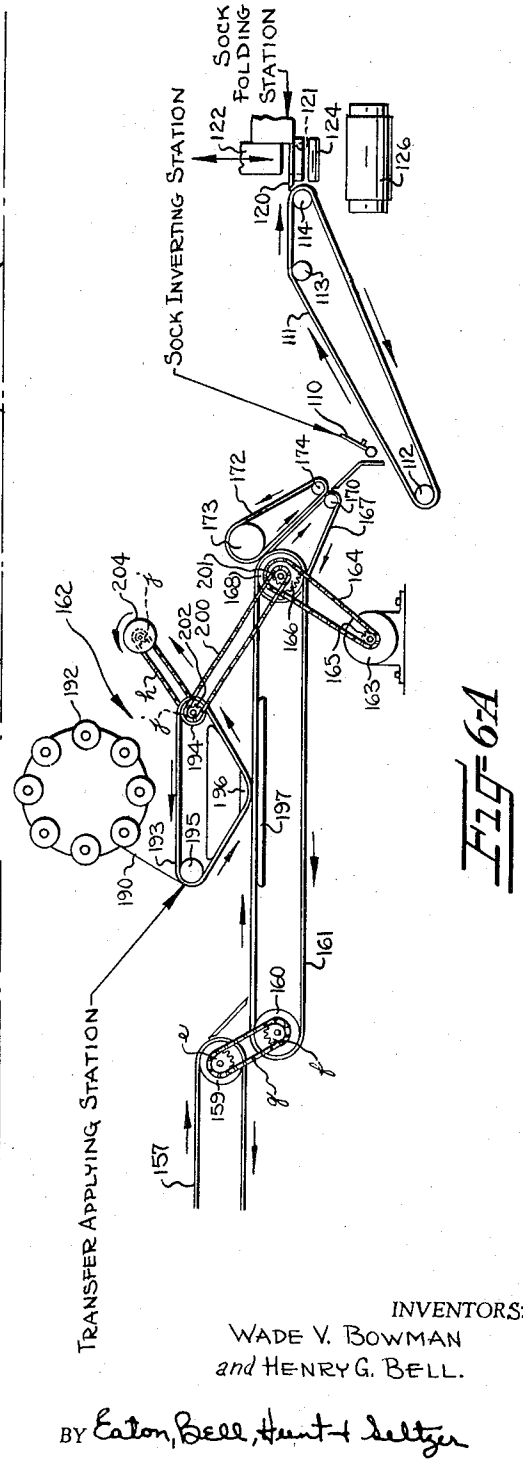


Fig. 6A

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United States Patent Office 2,838,217 Patented June 10, 1958

2,838,217

METHOD OF FINISHING KNITTED ARTICLES

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Application July 26, 1956, Serial No. 600,230

3 Claims. (Cl. 223—60)

This invention relates to the art of finishing knitted articles, such as socks and other hosiery in particular, to prepare them for examination and purchase by the public, and it is a primary object of this invention to provide a novel method of finishing socks and other hosiery, after they have been dyed and extracted, which eliminates many of the finishing operations required heretofore with resultant faster production than has heretofore been attainable and which method practically eliminates the necessity of storing finished socks in order to meet the demand for such socks as they are ordered by the retailer.

Heretofore, the method of preparing stockings made from cotton and other similar materials for marketing after the stockings have been dyed, washed and dried has required the steps of positioning each stocking on a dry form which was heated by steam or electricity. Such dry forms were usually positioned upon a table with approximately twenty-four of them to the table, depending upon the ability of the individual operator. In other words, it was necessary that each sock or stocking be subjected to heat on the forms for a certain period of time in order to insure that the stockings were shaped or "boarded" properly. The operator would replace each sock or stocking thus boarded with another as he approached each dry form.

As each stocking was removed from a dry form it was placed on a suitable tray, the stockings usually being stacked in piles of a dozen each. The operator would then transfer the stacks of stockings, including a dozen in each stack, onto another tray or board positioned at the end of each table and, when a given number of dozens were placed upon the board, the operator carried the board with the stockings thereon to another part of the finishing room and would either place the board with the stockings thereon in a bin for storage purposes or deliver the board with the stockings thereon to the pairers. Each pairer would then remove the stockings from the board on which they had been placed by the operator who performed the final boarding operation (which often required that the pairer go to the boarding room to collect the board with the dozens of pairs thereon), and then place the stockings on a table where the stockings in each lot were paired, inspected and graded into firsts, seconds, thirds, etc.

Thereafter, the stockings again were stacked in dozens on a suitable board or tray and returned to the bins for storage unit such time as a particular size and type of stocking was ordered by the retailer. When such an order was received, the employee, who was to prepare the stockings for shipment to the retailer, had to search through the various storage bins and collect boards having stockings which were manufactured according to the requirements of the order, and deliver such stockings to a transfer or marking operator who would then apply a number of decalcomanias or transfers to the stockings. Such decalcomanias or transfers usually include the size

and quality of the stockings and a trade name. The latter operation involved removing the stockings from the board on which they were positioned when delivered to the transfer operator, then applying the decalcomanias or transfers to the stockings and then stacking them, in dozens, on another board or tray whereupon they were delivered to another operator who again removed the stockings from the corresponding tray or board, positioned them on a table, applied so-called "rider" tickets to each pair of stockings (usually by means of a stapling machine or by adhesive means), and then again stack them on the latter board or tray. The pairs of stockings on the latter board were then delivered to another operator who removed them from the latter board, placed them on a table, folded them and then boxed them ready for shipment.

It is apparent that the above method used heretofore has been costly and time-consuming; causing tardiness in making shipments, required considerable space for storage of the stockings and has required that an exceptionally large inventory of finished stockings be maintained in order to fill each order received as quickly as possible.

It is therefore another object of this invention to provide an improved method of handling stockings after they have been dyed, washed and dried in which many of the operations required heretofore are eliminated with a resultant increased rate of production in a given period as compared to the method used heretofore and which method practically eliminates or, at least, considerably reduces the required inventory of the manufacturer as compared to the inventory required in order to satisfy the requirements of the method heretofore employed.

The improved method includes subjecting opposite sides of pairs of stockings or other textile articles, which have been positioned on flat, disposable, strip inserts substantially in the shape of the articles, to pressure and heat to "board" the articles on the inserts for distribution to the public while on the inserts. The resultant package is generally of the type disclosed in United States Patent Nos. 2,696,295 and 2,748,930, for example.

More specifically, it is an object of this invention to provide a method which includes placing each pair of stockings on a thin, flat, elongated strip insert or board of sheet material; made preferably from a cardboard, chipboard or related paper type material, but which may be made from plastic or sheet metal, if desired, and then pressing the stockings, while on the insert, between platens while subjecting the same to heat to board the same for sale to the public while on the insert.

By mounting stockings or other knitted articles on flat inserts, this renders such articles capable of being picked up by suction cups or similar suction devices. Accordingly, it is another object of this invention to provide a method including using suction means to feed such articles from a stack onto a conveyor and moving successive articles, either intermittently or continuously, through a press or ironing machine for pressing the articles to conform them with the shape of the inserts positioned therein, during which pressing, the articles may be subjected to steam.

This method facilitates rapid boarding of stockings, since, for example, pairs of stockings, after being pressed or boarded on the inserts may be delivered, on the conveyor, to a machine which automatically transfers decalcomanias to the stockings, after which the "rider" tickets may or may not be applied to each pair of stockings. The stockings may then be inverted and passed over a platform having a slot therein extending transversely of the longitudinal axis of each successive pair of stockings, whereupon a rigid member passes downwardly against the stockings and forces them through the slot to fold the same. In order to further insure that the fold is properly

formed, the stockings may be passed between driven calendar rolls or pressure rolls and then passed onto another conveyor for transferring them to the shipping department.

Some of the objects of the invention having been stated, other objects will appear as the description proceeds, when taken in connection with the accompanying drawings, in which—

Figures 1 and 1–A are, collectively a schematic view illustrating the machinery and steps through which the stockings pass in accordance with one form of the improved method, and showing other related processes;

Figure 2 is an isometric view of one of the inserts or forms prior to its being positioned within a stocking or a pair of stockings;

Figure 3 is an isometric view similar to Figure 2, showing a pair of stockings mounted on the insert, with portions of the stockings and insert broken away;

Figure 4 is a fragmentary vertical sectional view mostly in elevation showing means for positioning insert forms in pairs of stockings and being taken substantially along line 4—4 in Figure 1;

Figure 5 is an enlarged fragmentary detail of means for folding the pairs of stockings on the insert forms, taken substantially along line 5—5 in Figure 1–A;

Figures 6 and 6–A are collectively a view similar to that collectively shown in Figures 1 and 1–A showing another embodiment of the improved method wherein the movement of the pairs of stockings on corresponding inserts through the pressing means and the transfer or decalcomania-applying means and to the folding means is uninterrupted whereas, in the first embodiment of the invention shown in Figures 1 and 1–A, the pairs of stockings on corresponding inserts are advanced through the pressing means and the transfer-applying means and to the folding means intermittently.

As heretofore stated, the improved process involves positioning a first stocking of a pair on a flat elongated form of sheet material made preferably from cardboard or other material of a weight and strength sufficient to support stockings in a flat position, but which will retain its rigidity and original configuration when the stockings are placed thereon and still possess a certain degree of flexibility. Thereafter, the second stocking of a pair is positioned over the first stocking and the insert form within the first stocking. The stockings may be positioned on the insert by any desired means. One embodiment of such means is disclosed in the copending application of Wade V. Bowman et al., Serial No. 499,392, filed April 5, 1955 and entitled Hosiery Form Inserting Apparatus and Method, but does not constitute part of the present invention. Of course, any reasonable number of articles may be placed on each insert form.

The term "stocking" is used in the specification and claims to define men's, women's and children's socks and stockings of the type known as ankle socks, as well as socks which extend as far as part way up on the calf of the wearer and particularly refers to stockings made from cotton, synthetic yarn, rayon and the like.

A typical disposable insert form which may be used in carrying out the present method is indicated at **10** in Figures 2 and 3. The form **10** is shaped to conform to the usual stocking in that it includes an elongated body **11** which is relatively thin, say, one-sixteenth of an inch thick, and which body **11** is provided with a rounded toe portion **12** at one end thereof, a flat ended, relatively narrow or reduced welt portion **13** at its other end and a rounded projection or heel portion **14** on a medial portion of the body **11**. Of course, the body **11**, its toe portion **12**, welt portion **13** and heel portion **14** conform substantially with the usual body, toe, welt and heel portions of the stockings to be positioned thereon. One pair of stockings is shown mounted on an insert form **10** in Figure 3, one of the stockings of the pair being indicated at **15** and the other being indicated at **16**.

Generally, the form inserting apparatus shown in the accompanying drawings comprises a stationary nest bar **20** which projects upwardly from a table **21** and against which the flat end or welt portion **13** of each successive insert or form **10** is positioned. The nest bar **20** is straddled by a pair of upright first or inner rigid insert form guides **22, 22** which are, in turn, adapted to be straddled by a pair of outer upright insert form guides **23, 23**. The insert guides **22, 23** are all of substantially the same shape and size throughout the major portion of the length thereof and are shaped to conform substantially to, and are preferably slightly larger than, the insert or form **10**, to the extent that each of the guides has a rounded free end or toe portion **25** and a medial outwardly projecting heel portion **26** thereon which conform substantially to the toe portion **12** and the heel portion **14** of the insert form **10**.

The lower portions of the inner form guides **22** extend downwardly through an opening **27** provided in the table **21** (Figure 4) and are fixed to a bracket **30** which is raised and lowered with a bar **31** by means such as a manually operated fluid pressure system generally designated at **32**. Since the fluid pressure system, which is partially shown in the form of a cylinder and piston in Figure 4, is fully described in said copending application, a detailed illustration and description thereof is deemed unnecessary. The bracket **30** also has the lower ends of the outer form guides **23** pivotally connected thereto, as at **35**, and a spring **36** (Figure 1) normally maintains the outer guides **23** in parallel alignment with the inner guides **22**.

The outer guides **23** have a suitable latch **37** thereon which, in the course of each upward movement of the guides **22, 23** engages a stationary, but releasable abutment **40** (Figures 1 and 4) so the outer guides **23** are swung out of alignment with the inner guides **22** as shown in Figure 1 with each upward stroke of the guides **22, 23**. On the other hand, when the abutment **40** is moved out of engagement with latch **37**, the outer guides **23** move into alignment with the inner guides **22**.

Thus, as each successive insert form **10** is mounted in vertical position with its lower edge upon the upper edge of the nest bar **20**, the form guides **22, 23** occupy lowered position and are then moved upwardly to occupy substantially the position of Figure 1. Thereupon, the first stocking **15** of a pair is drawn over the form guides **22** and, thus, over the insert form **10** then positioned between the guides **22**. Thereupon, the outer guides **23** are released so they move to occupy positions in parallel relation to the inner guides **22** and the second hose **16** of the pair is then drawn over the outer guides, in the course of which it is drawn over the inner guides **22** and the insert form **10** therebetween.

The form guides **22, 23** are then moved to lowered position relative to the nest **20** and table **21** and the corresponding pair of stockings on the insert are then placed upon a conveyor **42** which may be constantly or intermittently driven, as desired. The conveyor **42**, which may be termed as sock or stocking delivery conveyor, then moves each successive pair of stockings on the corresponding insert into a stacking container **43**, of any desired construction, to form a stack of paired hose **44** therein. The stack of paired hose **44** is then positioned upon a platform or elevator **45** of a suction-type sock feeding device **46** preferably of a well known type generally used in the paper-printing industry for feeding paper to printing machines. A typical suction feeding device of this type is manufactured by Davidson Corporation, 29 Ryerson Street, Brooklyn 5, New York, and described in a folder entitled Model 241 Davidson Dual Standard. Accordingly, a detailed description of the suction-type feeding device **46** is deemed unnecessary.

It should be noted here that an extremely important feature of the present method resides in the fact that stockings are rendered capable of being picked up by or

attracted to suction cups due to the insertion of insert forms 10 therein, the positioning of insert forms in the stockings being the first step in the present method.

The elevator 45 of the stocking feeding device automatically moves upwardly in a step-by-step manner so as to position the uppermost pair of stockings in the stack 44 for engagement by a suction pick-up and advancing device which performs a second step in the present method. This device is generally designated at 47 and is part of the feeding device 46. The suction feeder 47 is in the form of one or more suction cups mounted on the lower ends of pivoted arms 50. The suction pick-up devices are connected to a suitable source of suction or a suction pump indicated at 51, by means of one or more conduits 52. As the arms 50 move to the broken line position shown in Figure 1, the suction is released so each successive pair of socks or stockings engages a constantly driven roller 53 to feed the same between a pair of constantly driven feed belts 55, 56.

The feed belts 55, 56 feed each successive pair of stockings 15, 16 and a corresponding insert form 10 onto an intermittently driven endless main conveyor 57 supported on an idler roller 58 and a driven roll 59, the roll 59 being intermittently driven by any suitable means. For the sake of convenience, roll 59 may be driven by suitable connections with an intermittently driven roll 60 of a decalcomania-applying or transfer-applying machine 61. The transfer-applying machine 61 and elements subsequent thereto do not constitute elements of the present invention. Said last-named connections may include sprocket wheels *a*, *b* and a chain *c*. The roll 60 is driven by a ratchet mechanism including a ratchet pawl 63 and a ratchet wheel 64, the ratchet wheel 64 being supported in fixed co-axial relation to the roll 60 and sprocket wheel *b*. A link 65 connects a crank 66 with the pawl 63 and the crank 66 is constantly driven by means of a pair of sprocket wheels 67 which are interconnected by an endless belt or chain 70.

The sprocket wheel 67 is driven by an electric motor 71. The ratchet mechanism 63, 64 and roll 60 are parts of a transfer-applying machine or decalcomania-applying machine such as is disclosed in U. S. Patent 2,286,458 issued to Wade V. Bowman et al. on June 16, 1942 and, therefore, the transfer-applying machine need not be described in detail.

As each successive stocking or pair of stockings on the insert is deposited upon the upper run of the main conveyor 57, it is then advanced through an ironing or pressing machine broadly designated at 75, this being an extremely important step in the present method. The ironing machine may be of conventional or other construction and is shown as being of a type manufactured by New York Pressing Machinery Sales, 880–888 Broadway, New York 3, New York and as disclosed in their sales sheet identified as Form No. 122. The ironing or pressing machine 75 comprises lower and upper heated platens which are normally spaced apart from each other. The upper run of the main conveyor 57 moves in sliding engagement with the upper surface of the lower platen 76 and, as each successive pair of stockings on an insert is advanced between the platens 76, 77, the upper platen 77 remains in open position.

During the interim between successive movements of the conveyor 57, the upper platen 77 is moved downwardly into pressing engagement with the stockings to thereby perform a "boarding" operation upon the stockings while on the insert, the inserts thus serving as boarding forms. The platens 76, 77 are preferably of sufficient length so that each successive pair of stockings on a corresponding insert is repeatedly pressed between the platens 76, 77.

As it is well known, a commercial ironing machine such as that exemplified at 75 in Figure 1, is provided with means whereby steam may be directed to either or both of the platens 76, 77 from a suitable source 80, when desired and, generally, as the stockings are initially pressed or ironed between the platens 76, 77, steam is admitted to the platens and the stockings. The flow of steam to the platens is interrupted prior to each upward movement of the upper platen 77 so the stockings are dried by the heat from the platens. Of course, many of such machines are provided with a suitable vacuum suction dryer to further insure that the stockings are dry as they move outwardly from between platens 76, 77.

In the first form of the invention shown in Figures 1 and 1–A, the conveyor 57 is advanced intermittently, as heretofore stated, and the movement of the upper platen 77 is controlled in timed relation to the movement of the conveyor 57 by means of a normally open switch 82 interposed in an electrical circuit to an electric motor 83. In this instance, a two-wire circuit is shown for operating the electric motor 83, the two wires being indicated at 84, 85 and the switch 82 being interposed in the wire 84. The wires 84, 85 extend from the electric motor 83 to a suitable source of current shown in the form of a plug 86.

The switch 82 is closed during at least a portion of each inactive stroke of the ratchet pawl 63 (Figure 1–A), in the course of which an upwardly biased arcuate member or spring 87 is engaged by the crank 66 and moved downwardly thereby against the switch 82 for closing the same. During each active stroke of the pawl 63, the crank 66 moves out of engagement with the arcuate member 87 to break the circuit to the motor 83.

It will be noted that the motor 83 drives a member, wheel or disk 88 to which the lower end of a link 89 is pivotally connected, the upper end of the link 89 being connected to the upper movable platen 77 of the pressing machine 75. Thus, with each inactive stroke of the pawl 63 (during which the conveyor 60 is stationary), the switch 82 is closed for a sufficient length of time to impart a revolution to the member 88, driven by motor 83, to move the upper platen 77 of the pressing machine 75 downwardly against the upper run of the conveyor 57 and against the upper surface of the lower platen 76 and to then return the upper platen 77 to raised position.

As heretofore stated, after the pairs of stockings pass through the ironing station or apparatus 75, they are advanced, by the conveyor belt 57 onto an endless conveyor 90 mounted on and driven by the roll 60. The conveyor 90 is a part of the transfer-applying machine, such as disclosed in said patent. The transfer-applying machine is more particularly shown as a type disclosed in the abandoned application of Wade V. Bowman, Serial No. 346,752, filed April 3, 1953 and entitled Transfer Applying Apparatus and Counting Mechanism Thereof.

The transfer machine is not an element of the present invention but is disclosed herein to point up the advantages of the present method. The transfer machine includes an idler roll 91 about which the conveyor 90 is mounted. The conveyor 90 is preferably in the form of a plurality of parallel, spaced, ribbon-like belts having relatively narrow endless discharge belts 93 disposed therebetween and also mounted in the roll 91. The discharge belts 93 are also mounted on small idler rolls 94. A pressure or retaining endless belt 95, mounted on rolls 96, 97 moves in engagement with the inclined upper runs of the discharge belts 93.

Strips or tapes 100 are pulled from their respective sources 101 by a driven take-up roll 102 and, in their course from the sources 101 to the take-up roll 102, the tapes 100 pass beneath a vertically reciprocable transfer-applying iron 103 which, during the intervals between successive forward movements of the upper run of the transfer machine conveyor 90, moves downwardly against the corresponding pair of stockings on its form 10 to transfer the indicia from the strips or tapes 100 to the outermost stocking of the pair. The machine is provided with conventional means, not shown, for stopping each successive pair of stockings upon a plate 104 which may also

move upwardly as the transfer-applying iron **103** moves downwardly.

As the stockings are advanced by the transfer-applying machine conveyor belt **90**, each successive article passes between the proximal runs of the discharge and pressure-applying belts **93**, **95** and are directed onto a plurality of oscillatable arms **110**, only one of which is shown in Figure 1–A. At predetermined intervals, the arms **110** are rotated to invert the stockings or article previously positioned thereon and drop them onto a conveyor **111** which is also driven in timed relation to the conveyors **57** and **90**. The conveyor **111** is mounted on rollers or rolls **112**, **113** and **114** and its upper run extends upwardly and forwardly at an angle and then horizontally and may deliver each successive pair of stockings on its corresponding insert onto a platform **120** which is slotted, as at **121** (Figures 1–A and 5), transversely of the longitudinal axis of the successive pairs of stockings.

A vertically reciprocable folding plate **122** is normally spaced above the platform **120** in alignment with the slot **121** and, as each successive pair of stockings is positioned upon the platform **120**, the plate **122** moves downwardly, creases and partially folds the corresponding pair of stockings and its insert intermediate its ends, as such shown in Figure 5. As the folding plate **122** moves downwardly through the slot **121**, the folded medial portion of the corresponding pair of stockings is forced between a pair of spring loaded and suitably driven calender rolls **124** which further assist in creasing and folding the corresponding pair of stockings and direct the same downwardly onto a constantly moving conveyor **126** which may carry the pairs of stockings to any suitable location such as a packaging machine, storage room or bin.

Modified form of the invention

A modified form of the improved method is illustrated in Figures 6 and 6–A. Generally, the method carried out by the apparatus shown in Figures 6 and 6–A is very similar to the method carried out by the apparatus shown in Figures 1 and 1–A, with the exception that, upon the pairs of socks, stockings or other knitted articles on corresponding forms being fed from the feeding station, the stockings move continuously; without interruption, through the ironing or pressing station and the transfer or decalcomania-applying station to the stocking inverting or turning device. Accordingly, as much of the sock form-inserting station, stacking apparatus, sock feeding station, the sock turning station and the sock folding station as is shown in Figures 6 and 6–A shall bear the same reference characters as the corresponding stations shown in Figures 1 and 1–A in order to avoid repetitive description.

Now, the method performed by the means shown in Figures 6 and 6–A includes the steps of positioning knitted articles, such as pairs of socks or stockings, on inserts and this may be carried out at the sock form inserting machine in exactly the manner heretofore described in the description of the first form of the invention to form the stack **44** which is positioned upon the elevator **45** and, whereupon, the uppermost pair of socks is transferred, by the suction devices **47**, to a pair of constantly driven belts **155**, **156** which feed each successive pair of stockings onto a constantly moving conveyor belt **157** mounted on an idler roll **158** and a constantly driven roll **159**.

The conveyor belt **157** may be driven by suitable connections with a roll **160** on which an endless conveyor **161**, of a transfer-applying machine **162**, is mounted. The transfer-applying machine **162** and the form-inserting and stacking stations are not elements of the present invention. The forms may be positioned in the stockings by any suitable means. The last-named connections may include sprocket wheels *e*, *f* and a chain *q*. The roll **160** is driven by any suitable motive means such as an electric motor **163** which is connected with a roll **168** on which conveyor **161** is also mounted. The motor **163** is connected with roll **168** by means of a sprocket chain **164** and a pair of sprocket wheels **165**, **166**, the sprocket wheel **165** being driven by the motor **163** and the sprocket wheel **166** being fixed in co-axial relation to the roll **168**. The conveyor **161** is preferably in the form of a plurality of relatively narrow belts in order to accommodate an endless transfer machine discharge conveyor **167** which is also in the form of a plurality of relatively narrow endless belts which, with the belts of conveyor **161**, are mounted on said roll **168** and a roll **170**. A hold-down discharge belt **172** is positioned above the discharge conveyor **167** and mounted on idler rolls **173**, **174**, the proximal runs of the conveyors **167**, **172** being inclined downwardly and forwardly from the upper run of the conveyor **161** for directing pairs of stockings or other knit articles from the transfer-applying machine **162** to the turning device **110**.

Referring now to the ironing station, here again, an important step in the present method is performed by means of a suitable pressing machine **175** (Figure 6), which may be substantially the same as the pressing machine **75** in Figure 1, but wherein the lower and upper platens **176**, **177** occupy closed position at all times during operation of the endless conveyor **157**, and the lower surface of the upper run of the main conveyor **157** moves in sliding engagement with the upper surface of the lower platen **176**. The upper surface of the upper run of the conveyor **157** is also engaged by an endless conveyor **180** mounted on idler rolls **181**, **182** and whose lower run moves in sliding engagement with the lower surface of the upper platen **177**. The conveyor **180** is preferably driven through contact with the upper run of the main conveyor **157** and the pairs of socks or stockings therebetween.

As is the case in the first form of the invention, the platens **176**, **177** may be heated by any suitable means, such as electricity or steam and, also, a suitable source of steam **185** may be connected to the platens **176**, **177** for moistening the stockings during the pressing operation, if desired.

The transfer-applying machine, of which the rolls **160**, **168**, the conveyor **161** and the discharge conveyor **167**, **172** are parts, is broadly designated at **162** and may be of substantially the type disclosed in said Patent No. 2,286,458. However, since the conveyor **161** moves continuously, an endless belt **193** engages the upper surface of the upper run of the conveyor **161**, or the pairs of stockings passing therebetween, and its lower portion is engaged by a heater or iron **196**. The belt **193** is mounted on a driven roll **194** and an idler roll **195** and a strip or strips **190** having spaced decalcomanias thereon are drawn from a source **192** and pass in engagement with the lower portions of belt **193**.

A fixed platform **197** is disposed beneath that portion of the top run of conveyor **161** which passes beneath the belt **193**, and the iron or heater **196**, to insure that indicia is transferred from the strip or strips **190** to the stockings passing between the proximal portions of the belt **193** and the conveyor **161**.

The endless belt **193** must, of necessity, be driven at the same surface speed as the conveyor **160** and, of course, the indicia on the strip **190** should be spaced to correspond to the space between adjacent pairs of stockings as determined by the suction feeding devices **47**. The endless belt **193** may be driven in any desired manner and, in this instance, a sprocket chain **200** is mounted on a pair of sprocket wheels **201**, **202** which are fixed in co-axial relation to the respective rolls **168**, **194**. Also, a take-up roll **204**, for the strip or strips **190** may be driven in timed relation to the surface speed of the conveyor belt **193**, as by a belt *h* and sprockets *j*.

It is thus seen that the stockings or other knitted articles are moved continuously as they are deposited upon the main conveyor **157** and passed through the ironing or pressing apparatus **175** and the transfer machine **162**. As

each successive pair of stockings is discharged from the transfer-applying machine 137 by the discharge conveyor belts 167, 172, it is then inverted by the turning device 110, deposited upon endles belt 111 and transferred to the sock folding station which functions in exactly the same manner in both Figures 1–A and 6–A.

It is thus seen that we have provided a novel method of finishing or finally boarding hosiery and similar articles which eliminates many of the operations heretofore involved in the finishing of hosiery and which also eliminates much of the "lost motion" heretofore involved in prior processes of this character. The improved process minimizes the amount of time involved in the finishing process to such extent that the necessity of maintaining a large inventory in the manufacturing plant is eliminated. According to the present method, hosiery or other knitwear may be taken directly from the extractor and placed on inserts either singly or in pairs and the inspection and grading of the hosiery may be carried out at the time that the inserts are positioned in the stockings.

It is apparent that different sizes of inserts or forms 10 would be required for different sizes of stockings. When the stockings are placed on the feed conveyor or delivery conveyor 42, in each instance, they may be passed directly onto the corresponding main conveyor 57 or 157. However, the automatic suction feeding devices 47 are used in order to insure that the stockings on the insert forms are properly spaced and to accommodate the corresponding transfer-applying machine.

As the stockings are positioned upon either of the conveyors 57 or 157, the stockings pass through the corresponding pressing or ironing station and are thus, finally boarded while on the insert form, thus eliminating the boarding operations which have been required heretofore following the removal of the stockings from an extractor. Although subsequent steps are not steps of the present method, the transfers or decalcomanias may then be automatically applied to each successive article, stocking or pair of stockings, as the case may be, and the "rider" ticket may also be automatically or manually applied to each stocking or pair of stockings in its course between the transfer-applying means and the folding station. The stockings may then be folded on the corresponding inserts and automatically transferred to another location where they may be fed into a tray or chute from which they may be taken and placed in conventional machinery for sorting and packaging the stockings for shipment.

Thus, the present method enables the finishing or processing of hosiery at such a speed, as compared to previous methods, that the stockings may be processed as orders are received from the retailer, with the result that only

stockings which have been dyed and extracted need be stocked or stored. This practically eliminates maintaining an inventory which, in many plants, would be valued at a million dollars or more. It has been found that the present process substantially reduces the cost of finishing hosiery after they have been dyed and extracted to approximately one half the cost of prior methods and reduces the floor space required for storage of stockings to approximately one fourth the floor space that has been required in prior processes.

Although the present method is described herein as being particularly applicable to hosiery, this is also meant to include many other forms of textile articles such as underwear, neckties and the like.

In the drawings and specification there have been set forth preferred embodiments of the invention and, although specific terms are employed, they are used in a generic and descriptive sense only, and not for purposes of limitation, the scope of the invention being defined in the claims.

We claim:

1. The method of boarding pairs of men's hose which comprises inserting a paper board form of disposable material and of substantially the same length and shape as a finished hose in one of the hose of a pair, inserting said first hose while on the form within a second hose of the pair, and then pressing the pair of hose while on the form between a pair of heated platens while subjecting the hose to steam.

2. The method of processing hosiery for marketing which includes the steps of positioning a disposable semi-rigid form member in a hose wherein the form member is of a length less than that of the hose and of the configuration desired of the hose, then positioning at least one additional hose over the first-mentioned hose and then subjecting the hose to sufficient heat, while on the form member, to heat-set the hose.

3. The method of finishing pairs of hose which comprise inserting a disposable paperboard form in a first hose of each pair, inserting the first hose while on the form in a second hose of said pair, and subjecting each pair of hose while on a corresponding paperboard form to sufficient heat to set the yarn from which the hose are made.

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