

June 27, 1944.

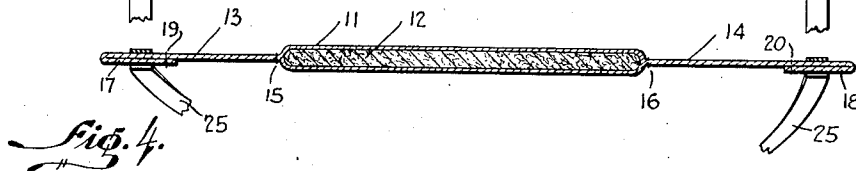
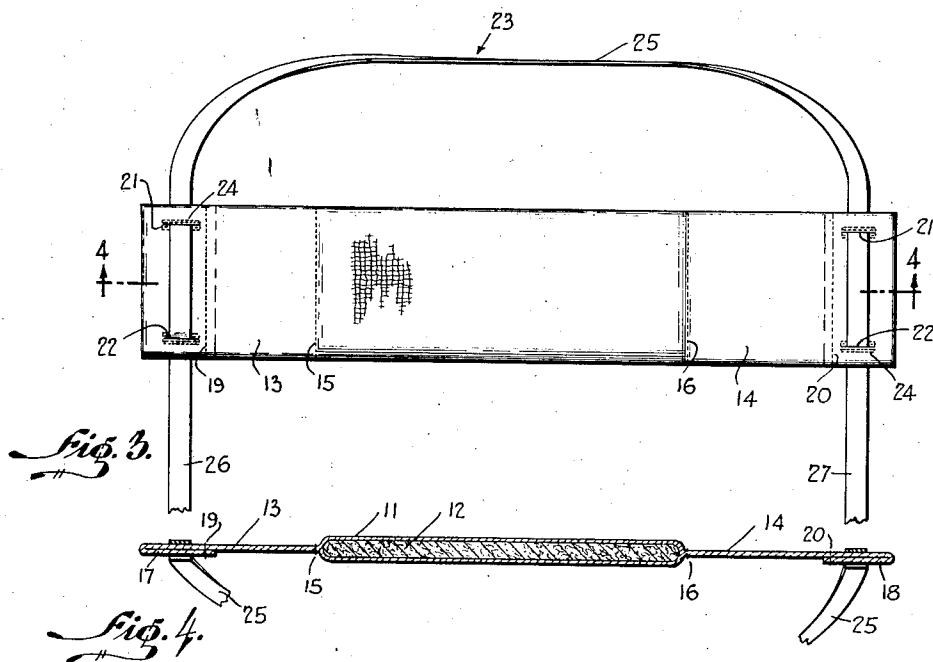
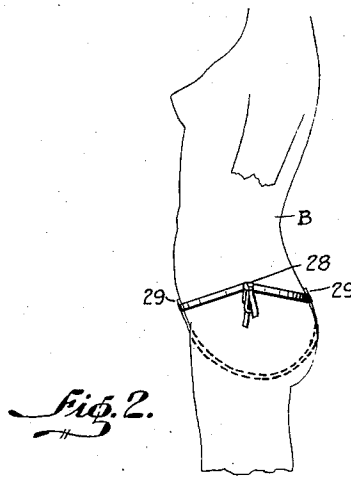
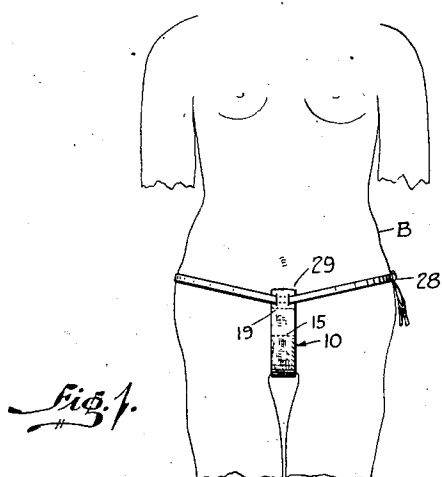
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2,352,228

CATAMENIAL BANDAGE MAKING MACHINE OR THE LIKE

Filed Feb. 18, 1939

6 Sheets-Sheet 1



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6 Sheets-Sheet 2

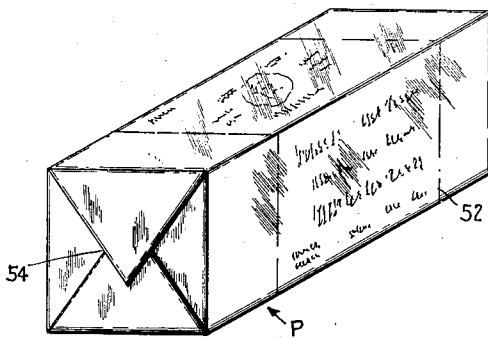


Fig. 5.

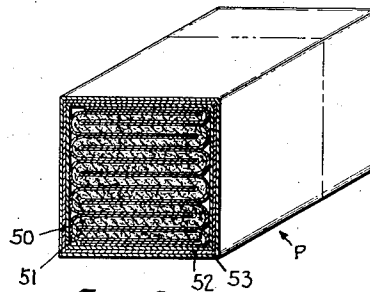


Fig. 6.

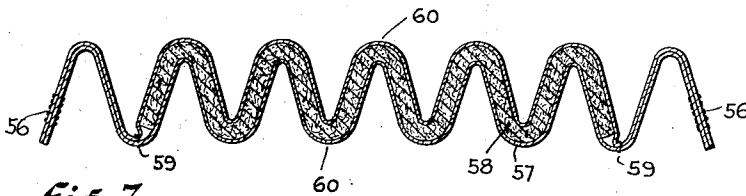


Fig. 7.

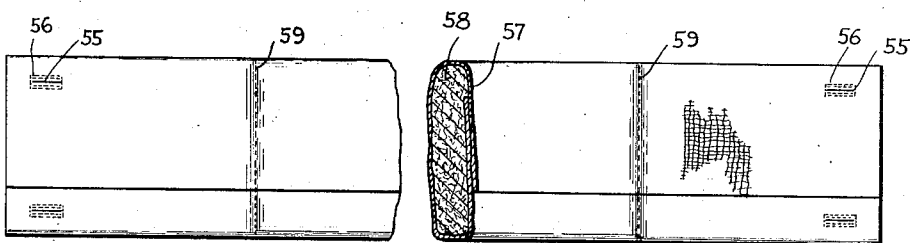


Fig. 8.

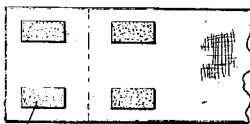


Fig. 8A.

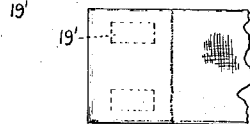


Fig. 8B.

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6 Sheets-Sheet 3

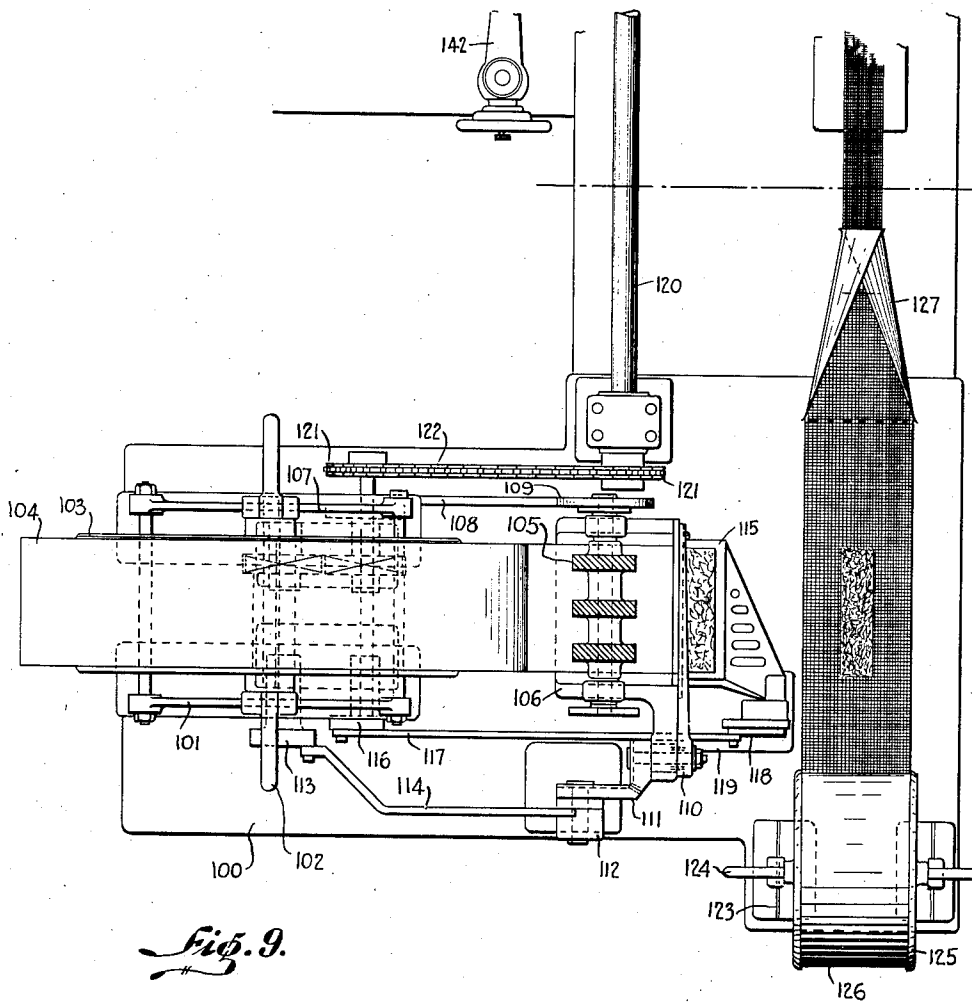


Fig. 9.

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6 Sheets-Sheet 4

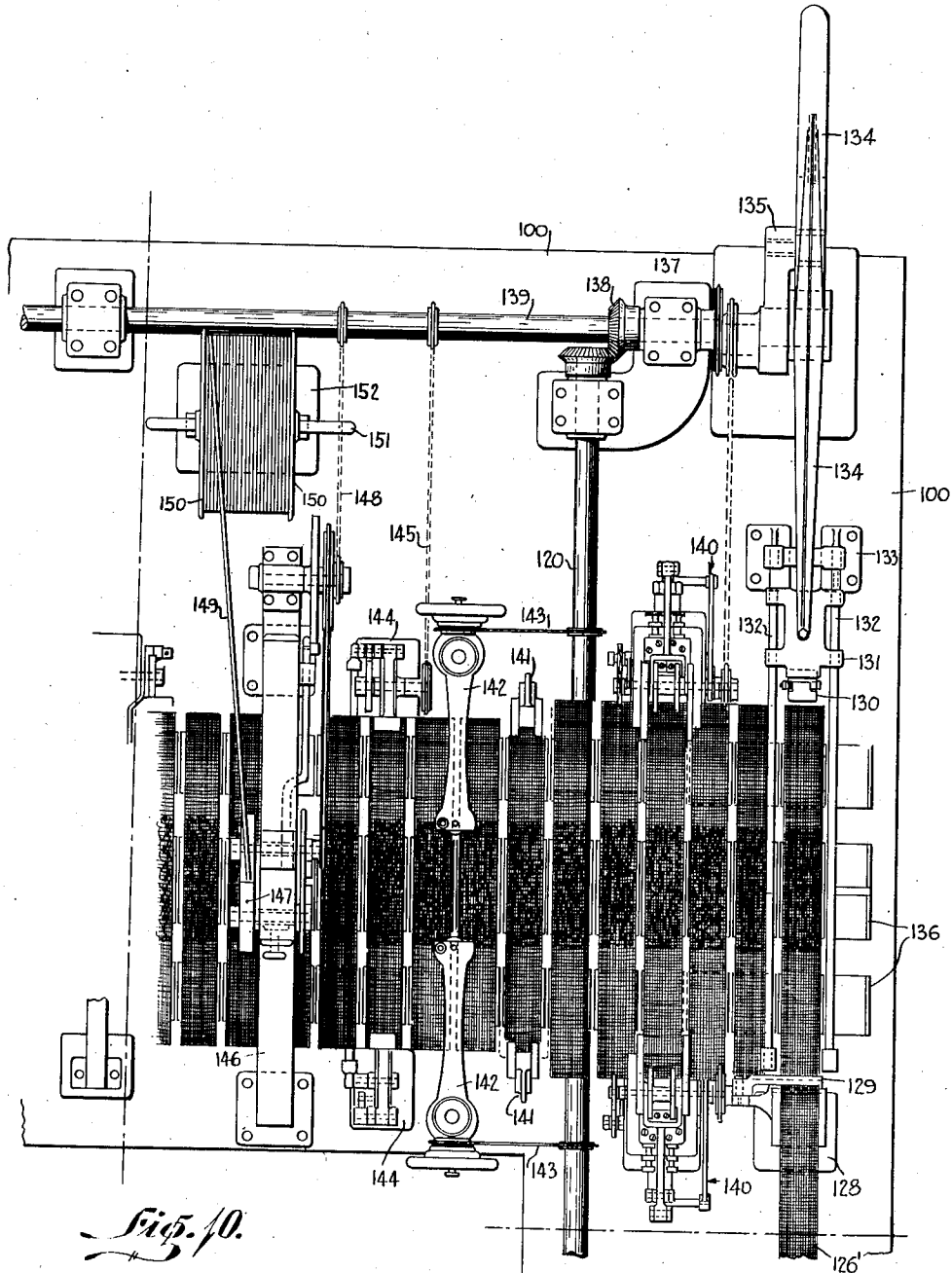


Fig. 10.

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CATAMENIAL BANDAGE MAKING MACHINE OR THE LIKE

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6 Sheets-Sheet 5

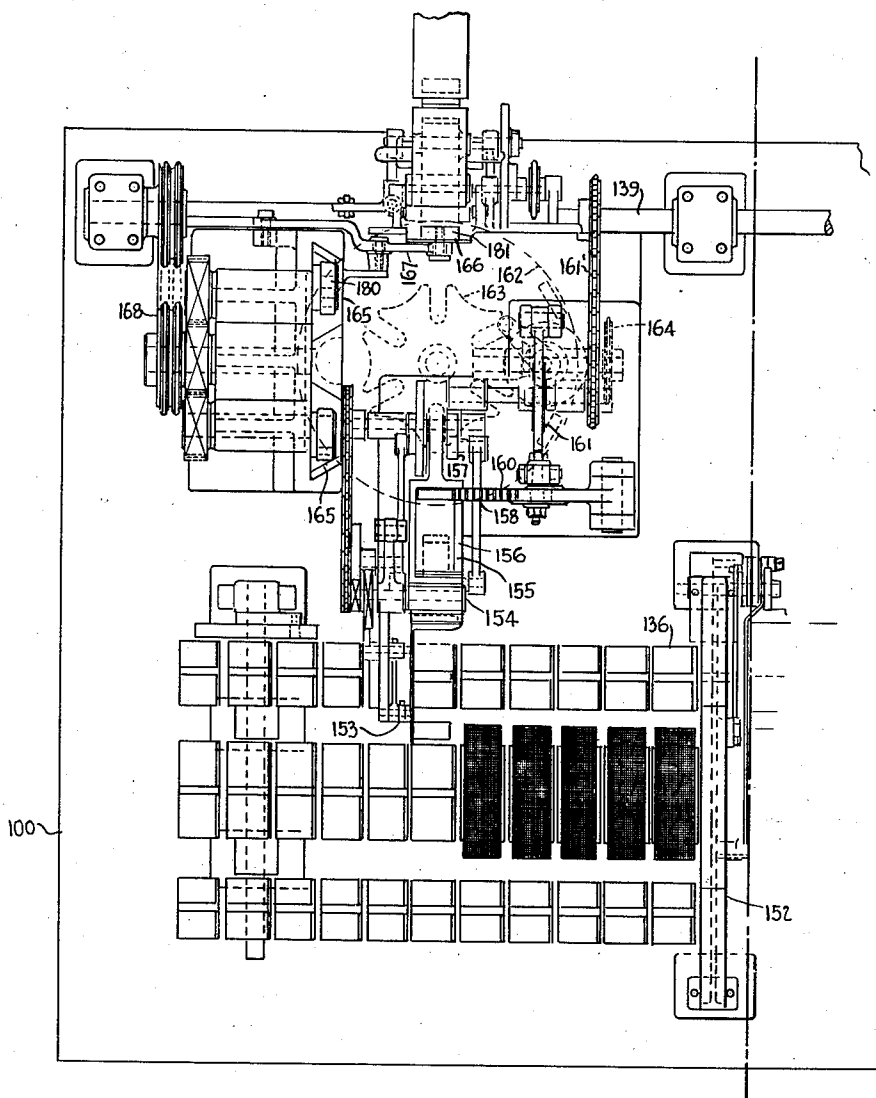


Fig. 11.

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CATAMENIAL BANDAGE MAKING MACHINE OR THE LIKE

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6 Sheets-Sheet 6

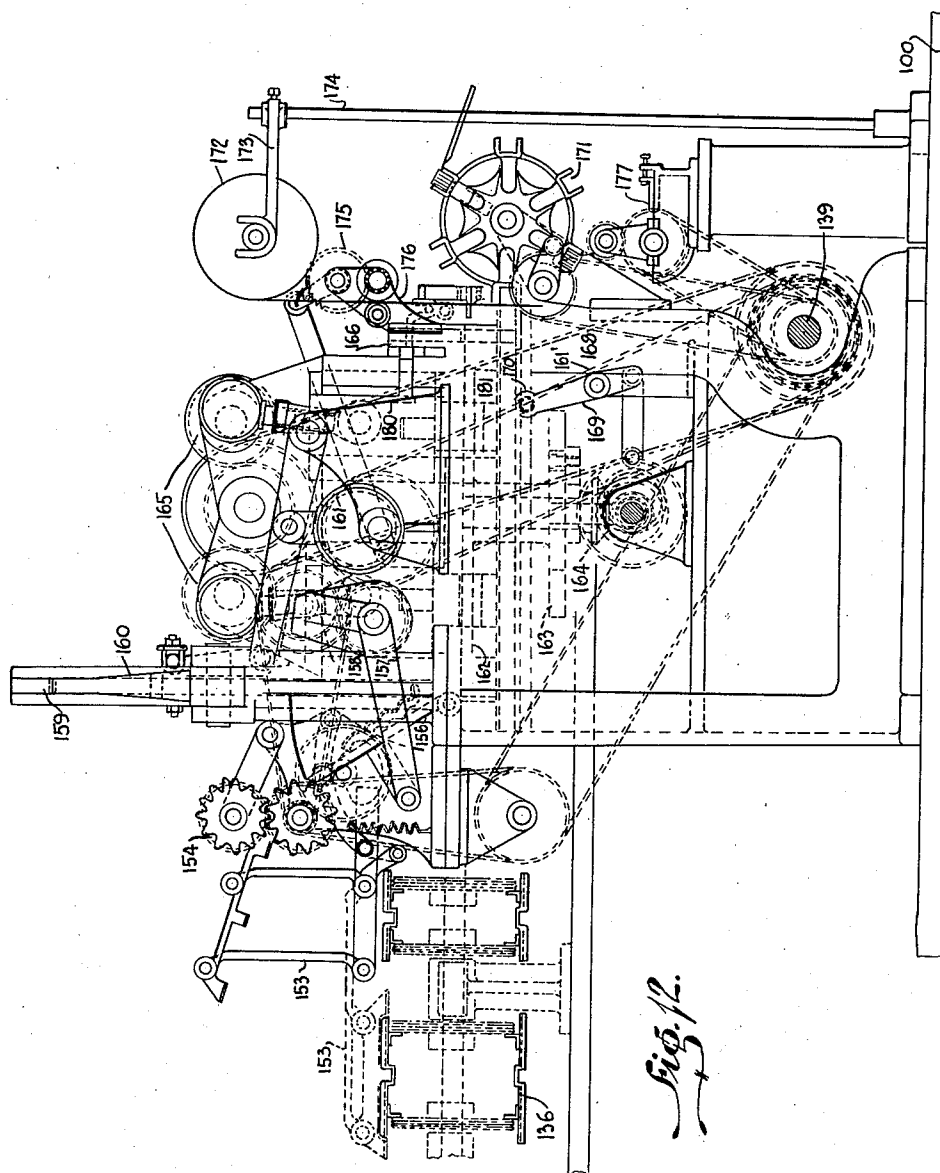


Fig. 12.

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UNITED STATES PATENT OFFICE

2,352,228

CATAMENIAL BANDAGE MAKING MACHINE
OR THE LIKELouis Schulman, Brooklyn, N. Y., assignor of one-
third to Maxwell E. Sparrow, New York, N. Y.

Application February 18, 1939, Serial No. 257,117

10 Claims. (Cl. 154—29)

This invention relates generally to improvements in bandages and their suspension means, particularly catamenial bandages; and more specifically to the making, folding and packaging of catamenial bandages.

In a catamenial bandage or the so-called "sanitary napkin," the thickness is not uniform throughout its length. This non-uniformity in thickness is due to the practical requirement of having the substantially thick absorbent portion of the bandage at its intermediate area, and the thin tabs at its ends for suspension thereof and for the comfort of the wearer.

This non-uniformity in the thickness of a catamenial bandage presents a problem which must be considered in the production and packing thereof, particularly, when it is desired to provide a catamenial package in compact form, enabling, for instance, a woman to conveniently carry the same in her handbag or to permit the same to be dispensed from a vending machine. In the production and packaging of a catamenial bandage according to this invention, this problem is taken into consideration.

It is an object to present a package containing a catamenial bandage in compact form, by accordion-pleating or folding the bandage and compressing the same into a small individual package; thus enabling the package to be conveniently carried in a woman's handbag, or to be dispensed from a vending machine.

Further objects of the present invention reside in the provision of means for making catamenial bandages and also in the means for folding and compressing the same into small individual packages.

It is a further object of the present invention to provide an improved and novel combined bandage and suspension means or support therefor, which is practical, efficient, economical and easily adjustable upon the wearer.

In addition to affording positive security with respect to the supporting of the bandage, the present invention has the advantage of providing instrumentalities for keeping the ends of the bandage in a spread and flattened condition, the spreading effect operating very materially to reduce excessive bulkiness, rendering the connecting ends unusually flat and compact.

It is a further object of the present invention to produce a bandage with a supporting means which will prevent the supported ends of the bandage from "gathering" or "puckering," and thus allowing the said ends to lie flat against the body of the wearer.

A further object of the present invention is to provide a catamenial device which will allow of proper adjustment upon the wearer, and which will avoid the use of common or conventional fasteners and supporters.

It is a further object of the present invention to provide a catamenial bandage which will remain flat against the body or garment of the user, and not mar the graceful lines of dresses, particularly tight-fitting ones, or destroy the effect of delicate sheer fabrics.

Still another object of the present invention is to provide a flat-lying catamenial bandage, which will not cause any discomfort to the wearer.

With the above and other objects in view, my invention comprises certain details of construction and arrangement of parts as will be hereinafter more fully described, illustrated and claimed, reference being had in the accompanying drawings which form a part of this specification and in which:

In the drawings:

Fig. 1 is a front view of a sanitary belt and napkin or catamenial bandage embodying the invention, and shown as applied to a body.

Fig. 2 is a side view of Fig. 1.

Fig. 3 is a top plan view of a belt and napkin or bandage according to one embodiment of the invention.

Fig. 4 is a sectional view taken through line 4—4 of Fig. 3.

Fig. 5 is a perspective view of a package containing the catamenial bandage folded into accordion pleats.

Fig. 6 is a cross-sectional view through the package illustrated in Fig. 5.

Fig. 7 is a sectional view through a napkin or bandage showing one typical way of folding the same.

Fig. 8 is a top plan view (partly broken away) of the napkin shown in Fig. 7 in flattened condition.

Fig. 8a is a modified view of napkin adjacent buttonholes.

Fig. 9 illustrates a plan view of the material feeding devices.

Fig. 10 illustrates a plan view of the conveyer system and the various mechanisms employed in the production of the sanitary napkin.

Fig. 11 is a plan view showing a construction of the conveyer system leading up to the final compression and wrapping of the sanitary napkin.

Fig. 12 is a side view (partly in section of Fig. 11).

Referring to the drawings and particularly to Figs. 1-4 which shows one example by which the invention may be realized, the numeral 10 indicates generally a catamenial bandage conventionally known as a sanitary napkin which may comprise a gauze shell 11 and a filler 12 of absorbent material which may be of the conventional type and which is located in the center portion of bandage or napkin 10, there being left the two free ends 13, 14. Shell 11 is formed by wrapping the gauze around the absorbent filler 12. The ends 13, 14 will, therefore, in this instance, consist of a plurality of layers of gauze. The filler 12 is held captive and prevented from shifting by the rows of stitches 15, 16. The free ends have folded-over portions 17, 18 which are secured to the body of the ends by means of lines of stitching 19, 20.

Each free end of the bandage 10 at its folded-over portion is provided with preferably two spaced-apart slots 21, 22 through which an end of the belt 23 is laced. These slots 21, 22 are preferably reinforced by stitches 24 and may be made in a conventional manner as by a button-hole machine. Belt 23 is laced through the napkin 10 to provide a loop 25 on one side thereof, the belt ending on the other side of the napkin in two free ends 26, 27 which, when the napkin is adjusted on the wearer, are tied together into a conventional knot or bow 28 (Fig. 1). By lacing the belt 23 through the button-holes 21, 22, the former will hold the ends of the napkin 10 flat against the body B of the wearer as indicated at 29 in Fig. 1. Belt 23 preferably comprises an inexpensive narrow tape made of any suitable material, discardable with the napkin.

The belt may be made of elastic or inelastic material. Instead of the belt being looped at one end as at 25, it may be provided with two free ends (not shown) similar to the ends 26, 27, so that, the tapes may be tied on either side of the body to hold the bandage in suspension; or the belt may be provided with two looped portions or ends similar to 25, this being preferable particularly where elastic tape is employed as the suspension means.

By the construction hereinabove described there is provided a catamenial bandage which will not "pucker" or gather at the ends nor bulge thereat, but will remain flat against the body of the wearer and which will not be made manifest through the clothing.

Although the example heretofore described refers to the use of the invention as a catamenial bandage it is understood that the same is applicable where bandages are generally employed, particularly where it is desired that the bandage be kept flat against the body to avoid discomfort and irritation.

A means of packaging the device is shown in Figs. 5-7. The package is preferably rectangular in shape, although it may be formed into any other shape. The package is made very compact by the means about to be described so that it can be conveniently carried by the person or dispensed from a vending machine. For example, where the bandage is in the form of a catamenial bandage, both it and its supporting means may be arranged to provide a package of a size approximately $2\frac{5}{8}$ " long by $\frac{5}{8}$ " wide by $\frac{5}{8}$ " high, although the bandage is of conventional size.

In order to provide a very compact package the bandage may be transversely folded into accordion pleats as clearly seen in Fig. 7. The ac-

ordion pleats 60 are preferably produced under pressure thereby reducing the dimensions of the bandage. The package P seen in Fig. 5 contains the bandage or napkin 50, in compressed accordion-pleated form and the suspension or supporting tape (not seen). The bandage and support may be wrapped first in a covering 51 of tin foil over which is placed a label 52, the whole being then wrapped in a suitable, preferably transparent covering or wrapper 53, such as, "Cellophane" or other cellulose material. The tin foil wrapper 51 and the "Cellophane" cover 53 may be folded at the ends of the package as indicated at 54. In this embodiment in lieu of stitches 19, 20 there are provided the adhesive spots 19' (see Fig. 8a).

Fig. 8 shows a bandage 50 made in accordance with the invention, provided with the button-holes 55 reinforced by the stitches 56. The bandage further has the gauze shell 57 and absorbent filler 58, which may be conventional, the filler being held in place by the stitches 59.

A machine or mechanism which may be employed to produce the aforesaid catamenial bandage or sanitary napkin, preparing the same in pleated and compressed form for the wrapping operation, and initially wrapping the same will now be described.

Referring first generally to this machine, the absorbent material is contained on a spool of suitable diameter and is fed by a set of feed rolls operated intermittently through suitable crank or cam movement actuating a ratchet on said wheels. A predetermined portion of the absorbent material is fed up to a knife properly spaced and the cut-off portion (12 of Figs. 3, 4 and 58 of Figs. 7, 8) is automatically deposited on a transfer plate. This transfer plate makes a 180° movement and deposits the absorbent material in the center of the gauze.

The spool of gauze is located at right angles to the transfer plate so that the absorbent material is deposited on the gauze section proportionally to the length and width thereof.

The gauze is then drawn through a folder which folds the gauze longitudinally (having the section of absorbent material located thereon) into a flat tube of the proper size. The folded gauze is now drawn up to a knife by means of gripper jaws actuated by a segmental lever, which cuts the gauze to the proper length (indicated by the numeral 11 in Figs. 3, 4 and 57 in Figs. 7, 8). This cut length is then deposited on a conveyor and is then brought to adhesive applicers which apply the adhesive (see 19' in Fig. 8a) on both ends of the cut gauze, simultaneously, by a system of segmental rolls which deposit the adhesive in predetermined spots. These adhesive spots are in lieu of the stitching 19, 20. From there the conveyor carries the same to a set of folders which fold over the ends (17, 18 in Fig. 4) of the cut gauze, approximately one inch from the ends and is then fed to a set of pressing rolls on each end to adhesively secure the folded down ends. The conveyor then feeds the cut gauze to a set of sewing machines which sew stitches (15, 16, in Figs. 3, 4, and 59 of Figs. 7, 8) at each end of the absorbent material thereby preventing the absorbent material from shifting and securing the same in position within the folded gauze. The now formed napkin is brought by the conveyor to a set of perforating knives located on either end of said napkin and two or more buttonhole openings (21, 22 or 55) are perforated on each end of the napkin; after which the conveyor brings it

under a system of feed rolls which deposits a predetermined length of tape used as a means of securing the napkin to the body of the user. This tape 23 is fed from a spool by means of intermittent feed rolls which provide the proper length and the tape is cut off at that length. The conveyer then carries the napkin and the tape to a folder which folds the napkin transversely into three parts with the tape enclosed. The conveyer then carries the thus folded napkin to a lifting fork which deposits the napkin into a set of corrugated rolls. The corrugated rolls transversely corrugate, crease or pleat the napkin and deposit it on an inclined platform which is a part of the mold wherein the napkin is compressed. This platform is hinged at its lower end and when the napkin is deposited thereon by suitable means this platform is closed into a predetermined position within the walls of this mold and becomes a rectangular box. A plunger descends within this box and presses the folded and pleated napkin into a compartment in a dial plate located directly beneath the mold.

The dial plate then makes preferably one-sixth turn which brings the compressed napkin to the first stage of further compression. The reason for producing complete compression by stages is to relieve the napkin of the confined air therein. The next stop of compression brings the napkin to a smaller compass than what is required, thus allowing for the expansion of the napkin which takes place upon release of the pressure produced by the plunger. Then the compressed pleated napkin is brought under another plunger which deposits the napkin on a transfer member below the dial plate. This transfer member is stationary. A ram operated by suitable means ejects it into a star wheel which is a part of the wrapping mechanism. From this point on the compressed, pleated and paper-enfolded napkin is wrapped in any conventional manner.

Referring now to the drawings, Fig. 9 shows a plan view of the material feeding devices for the sanitary napkin or catamenial bandage. The numeral 100 indicates a platform upon which is mounted a reel frame 101 on which is placed a mandrel 102. Mounted on mandrel 102 is a spool 103 carrying a roll of absorbent material 104. Mounted on frame work 106 by suitable brackets are the feed rolls 105 which are operated by a cam or eccentric 107 which in turn operates bar 108 actuating ratchet 109. Knife arm 110 is supported by bracket 106 mounted on platform 100. This knife severs the absorbent material after the proper amount has been fed, and is actuated by a pair of bevel segments 111 supported by bracket 112 mounted on platform 100. Crankplate 113 operates connecting rod 114 and operates segments 111. Transfer plate 115 receives the cut absorbent material and by means of crankplate or cam 116 operating connecting rod 117 and segments 118 makes a 180° turn and transfers the absorbent material on the gauge in the proper location for the subsequent operations. This transfer member is supported on bracket 119 and is mounted on platform 100. 120 is a power shaft and 121 is a pair of sprockets actuating chain 122 and supplying means to operate the aforementioned mechanisms.

123 is a reel supporting a mandrel 124 and holds a spool 125 containing a roll of gauze 126 and mounted on platform 100. 127 indicates a folder in a fixed position and by the simple act of drawing the gauze through the same will cause a three layer fold. The folder 127 is mounted on platform 100.

A bracket 128 upon which is mounted knife 129 severs the folded gauze and makes the proper length of napkin. Bracket 128 is mounted on platform 100.

A gripping member 130 is carried on sliding bracket 131 which slides on guide rods 132, the same being held by bracket 133 mounted on platform 100. The function of gripping member 130 is accomplished through the action of the arm 134 operated by crank 135 which operates in the following manner. The arm 134 moves with a forward and backward motion through the rotation of the crank 135; the gripper jaws 130 are held open by suitable means through the forward movement and as it passes underneath the upper knife 129 the gripper jaws 130 close on the folded gauze 126 enclosing the absorbent material 104. On the return movement of the arm 134 the entire length of the napkin is drawn out, the gripper jaws 130 are opened and the end of the napkin is cut off by knife 129 and is at the same time deposited on conveyer 136. An adhesive device 140 is located on each end of the napkin. The rotary applicators 140 print the proper amount of adhesive on each end and return to their places of rest thereby releasing the napkin to be carried by the conveyer 136 for the next step. Two rotary compression members 141 are hinged on its lower end, and their function is to press down the two ends of the napkin to make the adhesive stick. Two conventional sewing machines 142 are operated by shaft 120 through sprockets and chains 143, the stitching of the machines secure by fastening the absorbent material in the gauze in its proper location and prevents shifting of the absorbent material during the subsequent manipulations.

Two perforating members 144, one located on each end cut a multiple of slits on each end of the napkin through the adhesive cemented parts with the object of providing openings through which the tape can be passed. This mechanism is operated by chain and sprockets 145 from the main shaft 139, all of which is mounted on platform 100.

A feeder 146 feeds a predetermined length of tape through the feed rolls 147, the same being operated intermittently and then cut off by a knife (not shown). Feeder 146 is mounted on platform 100 and is operated through chain and sprockets 148 and power shaft 139. Tape 149 is taken from spool 150 which is placed on mandrel 151 supported on reel 152 and mounted on platform 100.

Conveyer 136 carries the napkin to folder 152 which folds the napkin in three parts transversely and encloses the tape therein, this folder 152 is operated through chain and sprockets (not shown) and driven by power shaft 139 and mounted on platform 100. Conveyer 136 carries the completely folded napkin to a forked lifting platform 153, the function of which is to lift the folded napkin from the conveyer 136 and deposit the front end to a pair of pleating corrugating or creasing rolls 154, the same rotating at a fast rate of speed and ejecting the napkin on an inclined plate 155 which is movable between side walls 156. This plate 155 is hinged at the bottom of the mold. After the deposit of the pleated napkin the inclined plate 155 is caused to close up by cam and lever action 157 and 158 and is followed by ram 159 shown in Fig. 12.

The compression ram 159 is actuated by segment 160 and powered by a device 161 comprising levers, connecting links, and eccentric, the

device being driven by chain and sprockets 161' and power shaft 139. The result of the compression ram's (159) action on the napkin is to compress the same in a pocket in the dial plate 162. The dial plate has six pockets and acts as a carrier for the compressed napkin in its step by step manipulations, and is actuated intermittently by the Geneva movement 163 driven by sprocket and chain 164 and power shaft 139.

The dial plate 162 rotating in clockwise direction brings the compressed napkin under the rams of the duplex press 165 which further compresses the napkin making the same ready for ejection by the mechanism 166 which is the fourth step of the compressing system. The mechanism 166 comprises the ejecting ram operated by lever 167 pivoted on the ram 180 of second press 165 and actuated by same. The duplex press 165 is driven by chain and sprockets 168 and powered by shaft 139. The completed compressed napkin is ejected in a receptacle located underneath the fourth pocket 181 of the dial plate 162 and is then further ejected into the star wheel 171 of the wrapping machine as shown in (Fig. 12) all of the foregoing being mounted on platform 109.

Fig. 12 is a side view of Fig. 11 showing details not seen on Fig. 11. 169 is the lever which actuates the ram 176 which ejects the compressed napkin into one of the pockets of the star wheel 171. 172 is a roll of wrapping material held in the reel 173 and supported by stand 174 mounted on platform 109. 175 is a system of feed rolls held by bracket 176. 177 is an adhesive box which gums the end of the wrapping material. From this point on the wrapped bandage may be further packaged as desired in any suitable manner.

I am aware that the invention may be embodied in other specific forms without departing from the spirit or essential attributes thereof, and I therefore, desire the present embodiments to be considered in all respects as illustrated and not restrictive; reference being had to the appended claims rather than to the foregoing description to indicate the scope of the invention.

Having described my invention what I claim as new and desire to secure by Letters Patent, is:

1. In a catamenial bandage making machine wherein absorbent material is fed, cut and deposited on gauze material and the gauze material folded over the cut absorbent material, the combination of means for gripping the folded gauze, means for moving the gripping means to draw the folded gauze a predetermined distance for a cutting operation, means for cutting a predetermined length of said folded gauze for producing a catamenial bandage, means for depositing adhesive on said bandage adjacent the ends thereof, means for folding over the ends of said bandage upon itself, means for pressing down said folded ends with the adhesive therebetween to form reinforced ends, means for perforating said bandage through said reinforced ends, means for depositing a predetermined length of tape upon said bandage, and means for folding end portions of said bandage transversely over its intermediate portion and said tape.

2. In a catamenial bandage making machine wherein absorbent material is fed, cut and deposited on gauze material and the gauze material folded over the cut absorbent material, the combination of means for gripping the folded gauze, means for moving the gripping means to draw the folded gauze a predetermined distance

for a cutting operation, means for cutting a predetermined length of said folded gauze for producing a catamenial bandage, means for folding over the ends of said bandage upon itself, means for securing said ends in said folded over position to form reinforced ends for said bandage, means for perforating said bandage through said reinforced ends, means for depositing a predetermined length of tape upon said bandage, and means for folding end portions of said bandage transversely over its intermediate portion and said tape.

3. In a catamenial bandage making machine wherein absorbent material is fed, cut and deposited on gauze material and the gauze material folded over the cut absorbent material, the combination of means for cutting a predetermined length of said folded gauze for producing a catamenial bandage, means for folding over the ends of said bandage upon itself, means for securing said ends in said folded over position to form reinforced ends for said bandage, means for perforating said bandage through said reinforced ends, means for feeding tape, means for cutting a predetermined length of said tape, means for depositing said predetermined length of tape upon said bandage, and means for folding end portions of said bandage transversely over its intermediate portion and said tape.

4. In a catamenial bandage making machine wherein absorbent material is fed, cut and deposited on gauze material and the gauze material folded over the cut absorbent material, the combination of means for cutting a predetermined length of said folded gauze for producing a catamenial bandage, means for producing reinforced ends on said bandage, means for perforating said bandage through said reinforced ends, means for feeding tape, means for cutting a predetermined length of said tape, means for depositing said predetermined length of tape upon said bandage, and means for folding end portions of said bandage transversely over its intermediate portion and said tape.

5. In a catamenial bandage making machine wherein absorbent material is fed, cut and deposited on gauze material and the gauze material folded over the cut absorbent material, the combination of means for cutting a predetermined length of said folded gauze for producing a catamenial bandage, means for feeding tape, means for cutting a predetermined length of said tape, means for depositing said predetermined length of tape upon said bandage, and means for folding end portions of said bandage transversely over its intermediate portion and said tape.

6. In a catamenial bandage making machine wherein absorbent material is fed, cut and deposited on gauze material and the gauze material folded over the cut absorbent material, the combination of means for cutting a predetermined length of said folded gauze for producing a catamenial bandage, means for producing reinforced ends on said bandage, means for feeding tape, means for cutting a predetermined length of said tape, means for depositing said predetermined length of tape upon said bandage, and means for folding end portions of said bandage transversely over its intermediate portion and said tape.

7. In a catamenial bandage making machine wherein absorbent material is fed, cut and deposited on gauze material and the gauze material folded over the cut absorbent material, the combination of means for gripping the folded

gauze, means for moving said gripping means to draw the folded gauze a predetermined distance for a cutting operation, means for cutting a predetermined length of said folded gauze for producing a catamenial bandage, means for feeding 5 tape, means for cutting a predetermined length of said tape, means for depositing said predetermined length of tape upon said bandage, and means for folding end portions of said bandage transversely over its intermediate portion and said tape.

8. A bandage making machine comprising means for feeding absorbent material, means for feeding gauze or the like, means for depositing said material on said gauze and including a transfer member, means for folding said gauze longitudinally over said material into a substantially flat tube, means for depositing a predetermined length of tape upon said bandage, and means for folding said bandage over said 10 tape.

9. A bandage-making machine comprising means for feeding absorbent material, means for feeding gauze or the like, means for depositing said material on said gauze, means for folding 5 said gauze longitudinally over said material into a substantially flat tube, means for depositing a predetermined length of tape upon said bandage, and means for folding said bandage over said tape.

10. A bandage-making machine comprising means for feeding absorbent material, means for feeding gauze or the like, means for depositing said material on said gauze, means for folding 10 said gauze longitudinally over said material into a substantially flat tube, means for securing the folds of said gauze adjacent the ends of said material to prevent endwise shifting of said material, means for depositing a predetermined length 15 of tape upon said bandage, and means for folding said bandage over said tape. 20

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