

Sept. 29, 1942.

C. A. JOA

2,296,931

MANUFACTURE OF SANITARY NAPKINS AND THE LIKE

Filed Oct. 30, 1937

3 Sheets-Sheet 1

Fig. 1.

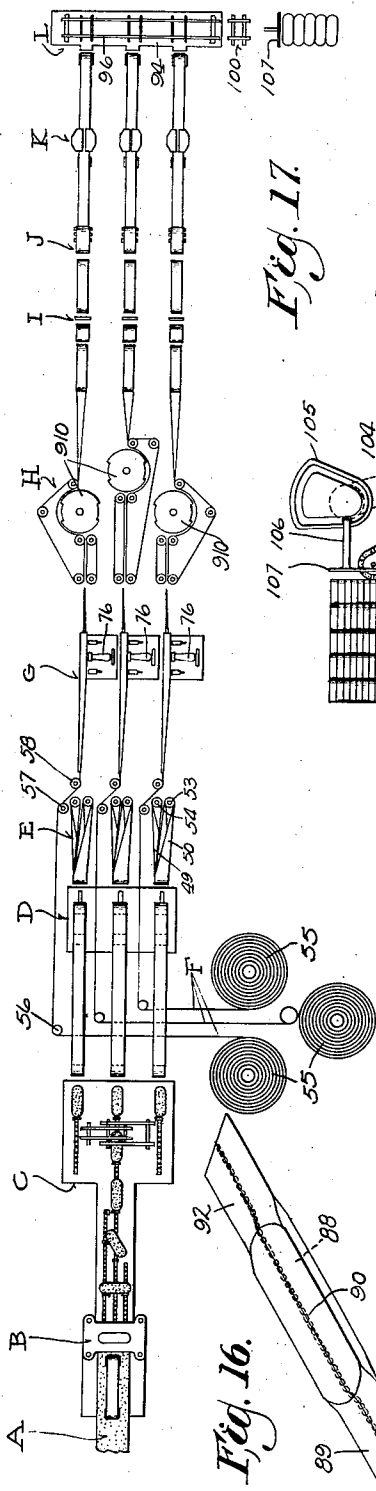


Fig. 16.

Fig. 17.

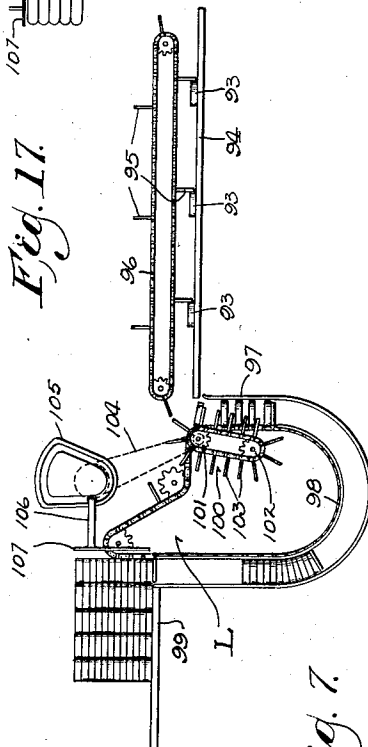
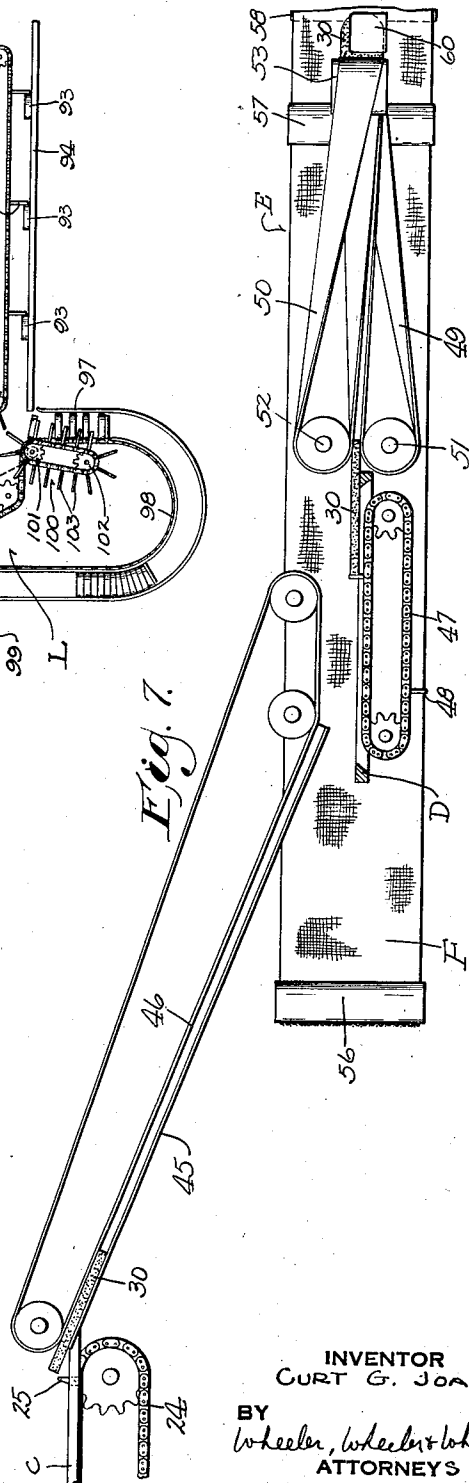


Fig. 7.



INVENTOR
CURT G. JOA
BY
Wheeler, Wheeler & Wheeler
ATTORNEYS

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3 Sheets-Sheet 2

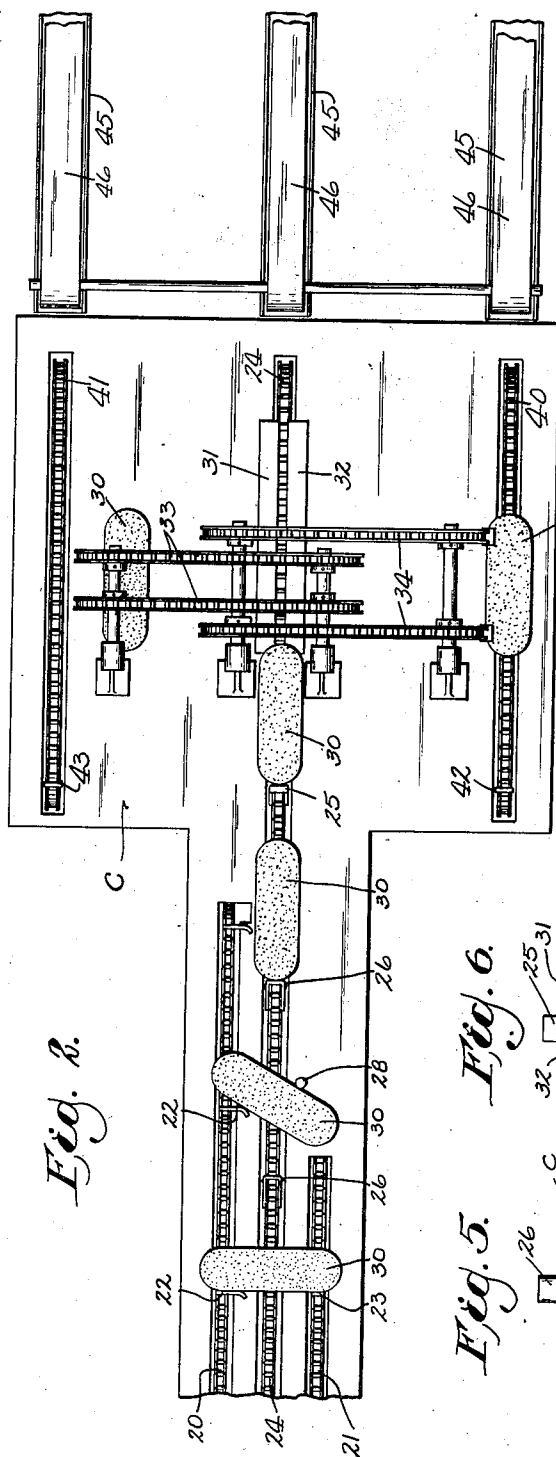


Fig. 5.

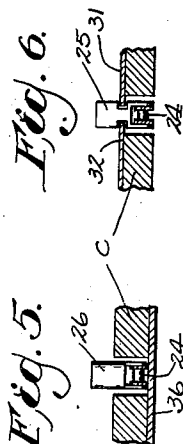
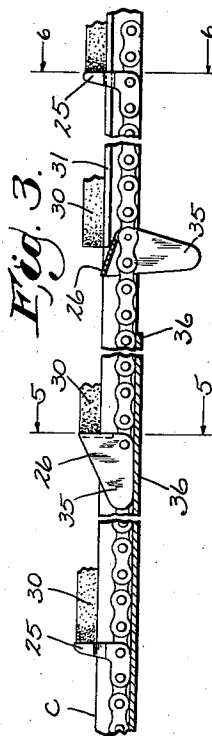
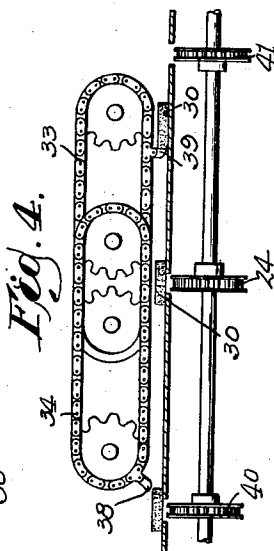
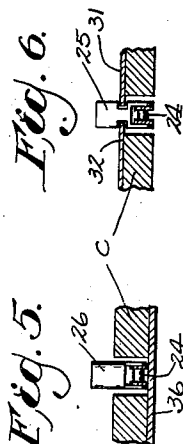


Fig. 6.



INVENTOR
CURT G. JOA
BY
Wheeler, Wheeler & Wheeler
ATTORNEYS

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3 Sheets-Sheet 3

Fig. 8.

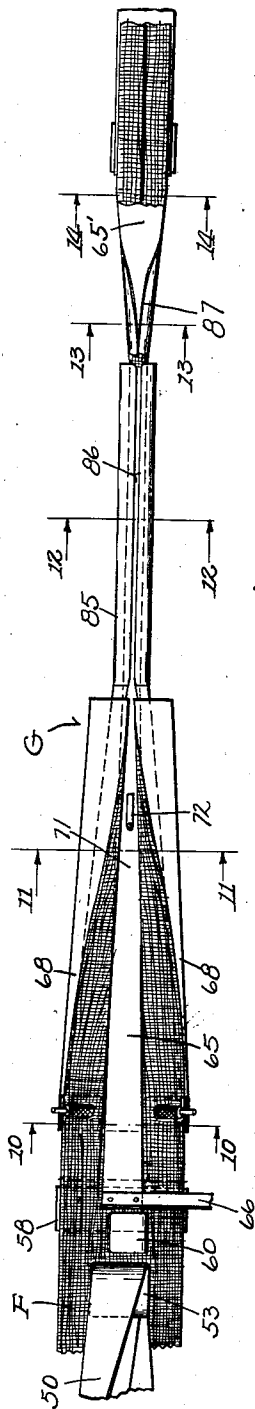


Fig. 9.

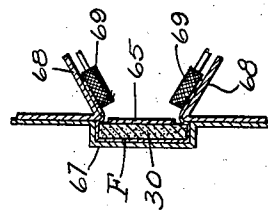
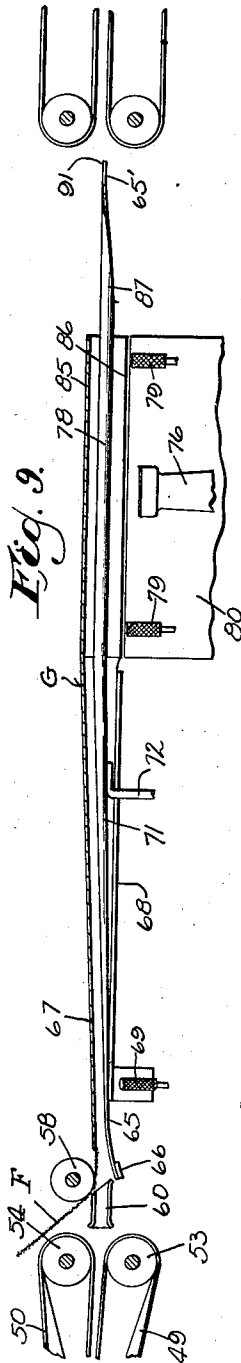


Fig. 10.

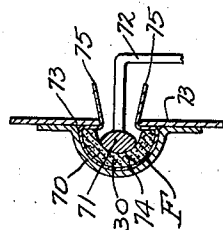


Fig. 11.

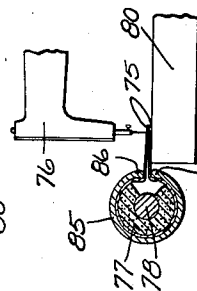


Fig. 12.

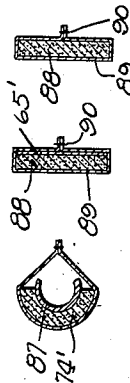


Fig. 13.

INVENTOR
CURT G. JOA
BY
Wheeler, Wheeler & Wheeler
ATTORNEYS

UNITED STATES PATENT OFFICE

2,296,931

MANUFACTURE OF SANITARY NAPKINS
AND THE LIKECurt G. Joa, Sheboygan Falls, Wis., assignor to
Curt G. Joa, Inc., Sheboygan Falls, Wis., a cor-
poration of Wisconsin

Application October 30, 1937, Serial No. 171,861

22 Claims. (Cl. 154—29)

This invention relates to improvements in the manufacture of sanitary napkins and the like. The present application is a companion to my application entitled "Sanitary napkin machines," Serial No. 54,669, filed December 16, 1935, now Patent 2,131,808, dated October 4, 1938, and to my application 130,686 entitled "Sanitary napkins and methods of manufacture thereof," filed March 13, 1937, now Patent 2,164,408, dated July 4, 1939.

It is the primary object of the present invention to provide a means for carrying out a disclosure of the application for patent last identified.

It is a further object of the present invention to provide for greatly accelerating the output of a sanitary napkin machine, regardless of the specific type of sanitary napkin produced thereby.

It is a further object of the invention to provide means for tightly stitching the gauze or other wrapper of a sanitary napkin about the pad portion thereof and disposing the seam on one face of the napkin to enable a reduction in the amount of material required to wrap a sanitary napkin pad, to improve the appearance of the finished product by maintaining the wrapper under tension about the pad, to improve the safety of such pad by stitching the side margins of the wrapper together, and to improve the comfort of the pad as compared with other stitched pads by forming the seam on a face of the napkin rather than a margin thereof.

Other objects will appear from the following disclosure. The drawings are largely diagrammatic but include considerable detail. I am aware of the fact that a number of changes may be made in the structure while still embodying the principle of the device as shown.

In the drawings:

Figure 1 is a diagrammatic plan view of a machine embodying this invention.

Figure 2 is an enlarged detail view in plan showing a portion of the feed and distributing table.

Figure 3 is a detail view in longitudinal section through the feed and distributing table.

Figure 4 is a view in transverse section through the feed and distributing table.

Figure 5 is a detail view taken in section on the line 5—5 of Fig. 3.

Figure 6 is a detail view taken in section on the line 6—6 of Fig. 3.

Figure 7 is a detail view taken in longitudinal section through a portion of the pad feeding and

turning means adjacent the point where the pad is introduced into the gauze.

Figure 8 is a view in side elevation through the adjoining portion of the machine where the pad is enveloped and stitched into the gauze.

Figure 9 is a view partially in horizontal section and partially in plan through the portion of the device shown in Figure 8.

Figure 10 is a view taken in section on the line 10—10 of Fig. 8.

Figure 11 is a view taken in section on the line 11—11 of Fig. 8.

Figure 12 is a view taken in section on the line 12—12 of Fig. 8.

Figure 13 is a view taken in section on the line 13—13 of Fig. 8.

Figure 14 is a view taken in section on the line 14—14 of Fig. 8.

Figure 15 is a view taken in section through the assembled sanitary napkin.

Figure 16 is a view in perspective showing the assembled sanitary napkin before the ends are folded.

Figure 17 is a detail view partially in end elevation and partially in transverse section showing the stacking mechanism.

Like parts are identified by the same reference characters throughout the several views.

Before attempting to describe the machine in detail, I will first describe its component features.

The pad material, which usually comprises a cellucotton web composed of multi-ply of tissue paper, is fed into the machine in web form at A. A plurality of separate webs may be derived from separate parent rolls and united in the machine as disclosed in my Patent 2,131,808. The composite web at A is fed into the cutting die mechanism B for blanking out the individual pads. This portion of the mechanism also may correspond to that disclosed in the above Patent 2,131,808. The individual pads are blanked transversely from the end of the web and are turned and advanced and distributed on the feed table C. The turning function is described in my companion case, but the distribution is original in this machine.

It is possible to blank out pads at least three times as rapidly as they can be incorporated in wrappers. Much of the mechanism, such as the several feed rolls, the slides used in the end folding and the like, may be operated in unison in a plurality of adjacent feed lines just as easily as a single unit can be operated. Accordingly, one of the features of the present machine consists in the fact that a single pad blanking mechanism

at B serves a plurality of assembly lines which are operated in unison to function concurrently on adjacent napkins to deliver three completed napkins simultaneously at the end of the machine for discharge into a common stacker.

Thus there is one web or composite web of pad material going into one end of the machine and one series of completed napkins discharged from the other end in stacks, but the intervening portion of the machine is divided into a plurality of assembly lines so that it can operate much more slowly than the input or discharge portions of the mechanism, thereby doing more accurate work with less danger of spoilage while at the same time enormously increasing the output of the machine. The arrangement is such that the machine takes but little more space than the single assembly line machine as heretofore made.

It is upon the feed and distribution table C that the pads are allocated to the several assembly lines. Thence they pass to the table D from which they are delivered in properly timed synchronism on to the turning belts E, whereby the three pads are concurrently turned upon their sides and delivered to three separate webs of gauze F.

The enveloping and stitching operation takes place in the unit G. The motive tension on the gauze and enfolded pads is supplied in the unit H. The gauze is severed between pads in the cut-off mechanism I. The first end fold takes place in the mechanism J. The second end folding takes place in the mechanism K, and the severed completed napkins are brought together and stacked in the stacker L.

The principle of the units I, J and K is identical with the corresponding units disclosed in my above identified Patent 2,131,808 although, as already indicated, for the purposes of the present invention, the several parts are made to operate in unison. Thus a single actuator can operate the several knives in each of the assembly lines. The rolls in the first end folder J can likewise be driven from a common shaft, and the slides in the second end folder K can be operated in unison from a single actuator.

The principle of the machine being thus broadly stated, I shall now describe in detail the several mechanisms in the sequence in which they operate on the work.

The feed and distributing table is shown in Figs. 2 to 6. As the successive pads are discharged from the blanking die they fall upon this table in the path of conveyor chains 20 and 21 which carry aligned lugs 22 and 23 for propelling the pads. Each pad is arranged to span an intervening conveyor chain 24 having two types of lugs at 25 and 26 respectively. Between each pair of consecutive lugs 25 there will intervene a number of lugs 26 corresponding to the number of assembly lines (in this case two). The several lugs 25 and 26 are otherwise equally spaced along the conveyor chain 24 to alternate with the positions of lugs 22 and 23 on chains 20 and 21.

It will be noted that conveyor chain 21 ends near the left hand side of Fig. 2. Conveyor chain 20 is carried somewhat farther along the table C. Central chain 24 continues to the end of the table. Shortly beyond the end of conveyor chain 21 I provide a fixed peg at 28 positioned to engage the side of one of the pads 30 to bring that side of the pad to rest. During the continued movement of the conveyor 20 its lug 22, engaging the other side of the pad, will cause the pad to

turn as indicated in Fig. 2. Ultimately, the space between lug 22 and peg 28 being substantially equal to the width of the pad, the pad will be aligned longitudinally with conveyor chain 24 to be engaged by one of the lugs thereof.

The notched lugs 25 are fixed to conveyor chain 24 as shown in Fig. 3. The pad engaged by such a lug will be propelled continuously across the table C and discharged from the end thereof. The notches in the side of the lug enable the lug to pass the closely spaced plates at 31 and 32 beneath the cross conveyors 33 and 34 respectively.

Lugs 26 on chain 24, on the other hand, are pivoted on the chain and carry tail pieces 35 which act as weights. Throughout the majority of the length of feed table C these tail pieces ride on the support 36 (Figs. 3 and 5). This support holds the lug upright in effective position. Shortly before the plates 32 are encountered, however, the support 36 terminates. As shown in Fig. 3 this allows the tail piece 35 to drop, the pivotal oscillatory movement of the lug being assured by engagement of its unnotched sides with plates 32. This leaves the pad propelled by that lug stationary on plates 32 in a position to be removed toward one side or the other by the cross conveyors 33, 34.

The cross conveyors 33 and 34 carry propeller lugs 38 and 39 respectively. In Fig. 4 one of the pads 30 has been delivered to the left, another has been delivered to the right, and a third is just being propelled by one of the notched lugs 25 down the center of the feed table.

Operating in synchronism with the central feed chain 24 are two side feed chains 40 and 41. Each of these chains preferably has a feed lug or lugs 42, 43 at such spacing that they will move along the feed table in exact synchronism with one of the notched lugs 25 of the central conveyor chain. Thus, after one pad has been delivered to one side of the feed table and one pad to the other, these two pads will be picked up to resume their lengthwise movement in step with advance of the third pad along the center of the feed table. Thereafter the operation is repeated.

From this point there are three assembly lines which act upon the three pads. It will only be necessary to describe one in detail.

Fig. 7 shows what next happens to the pad 30 after it is discharged from the feed table C. It passes along the upper surface of a chute 45 propelled by the lower surface of a belt 46. The three pads correspondingly thus propelled are discharged on to table D for timed delivery by means of the chain 47 and lugs 48 between the guide belts 49 and 50 comprising the portion E of the machine.

In order to permit of the direct and substantially rectilinear feed lines herein disclosed, it has been found desirable to turn each pad on its side for the purpose of introducing it into its wrapper, enveloping it in the wrapper, and stitching the wrapper about it. Accordingly the axes of the pulleys 51 and 52 for the guide belts 49 and 50 are horizontal, but the axes of the pulleys 53 and 54 at the other end of such belts are vertical. In consequence, the pad, which enters between the belts in a horizontal position, is discharged from the delivery end of the belt on edge as clearly appears in Figs. 1, 7, 8 and 9.

The parent rolls 55 for the gauze or other wrapping material are likewise disposed on vertical axes as clearly appears from Fig. 1. The web of gauze passes from each roll about a suit-

able guide 56 and thence about guides 57 and 58 into alignment with the path along which the pads are discharged from belts 49 and 50 (see Figs. 1 and 9). A float 60 guides the pad on to the face of the gauze web.

Almost immediately the web enters the forming, wrapping, and stitching mechanism G, (Figs. 8 to 14). The forming plate 65 engages the face of the pad, such plate being supported on a bracket arm 66. Under pressure of the plate the pad and the central portion of the adjacent gauze web F are pushed into a channel 67, whereby the margins of the gauze are folded on to the sides of the pad. The channel 67 carries wing members 68 initially projecting directly oppositely in the plane of plate 65. Coacting with these wing members are the tension rolls 69 which hold the margins of the gauze web smoothly on the wing members to be gradually folded toward each other over the face of the pad as the web and contained pads advance through the machine.

The forming trough 67 which appears in the section shown in Fig. 10 gradually changes from a rectangular cross section to a concave cross section as shown at 70 in Fig. 11. Simultaneously, the forming plate 65 becomes reduced in width and increased in thickness to the form of a bar 71 of ovoid cross section as shown in Fig. 11, such bar being supported at intervals by bracket arms 72 which project between the converging wing portions 73. The arrangement is such that the pad is gradually folded longitudinally to the form shown at 74 in Fig. 11, thereby reducing its width and permitting the margins 75 of the wrapper to be brought into closer and closer proximity.

By the time the parts reach the position shown in Fig. 12 opposite the stitching head 76, the pad has been folded almost into the form of a split tube as indicated at 77, the folding member originally flat as at 65 in Fig. 10 and then ovoid as at 71 in Fig. 11, being now circular in cross section as at 78 in Fig. 12. Thus folding the pad I produce considerable slack in the wrapper, leaving the margins 75 thereof projecting for a substantial distance from the pad and drawn flat by the rolls 79 upon the sewing table 80. In this position of the margins of the gauze such margins are sufficiently cleared to permit the ready operation thereon of a conventional sewing head, preferably of the type to produce a chain stitch or other stitch which can readily be unlooped by merely pulling one of the ends of the thread. The pad is held in this folded position about bar 78 by the channeled former originally of rectangular trough-shape as shown at 67 in Fig. 10, and then concave as shown at 70 in Fig. 11, and finally in the form of a split tube as indicated at 65 in Fig. 12, its margins 86 being sufficiently close together so that there is barely room for the gauze margins 75 to project.

It will be understood that the gauze and the enfolded pads are continuously advancing through the forming devices and past the sewing head to produce the progressive deformation of the pad as indicated in Figs. 10 to 12. The gauze is stitched continuously along its margin but the pads, by the mechanism already described, are only supplied to the gauze at intervals. Consequently there is space intervening within the stitched tube of gauze between successive pads enfolded therein.

As soon as the pads and gauze pass the stitching heads 76 (there being one such forming device and one such stitching head for each assembly line) the shape of the forming trough and bar

progressively re-approach the initial shape of these parts. Beyond the bracket 72 shown in Fig. 9, the bar must be entirely unsupported because no further brackets can penetrate the continuous tube of gauze wrapping material, the margins of which are now stitched together.

By the time the gauze tube and enfolded pads reach the position indicated by the section line 13 in Fig. 8, the forming channel at the back of the gauze has been discontinued. The bar 78 has changed its shape to the open crescent form indicated at 87 in Fig. 13. About this core the pad has a form 74' similar to that indicated at 74 in Fig. 11. It tends, however, to retain its curvature in cross section and consequently the core member is gradually flattened out to straighten the pad. At its discharge end the core member again comprises the flat plate shown at 65', almost identical in cross section to the plates 65 which hold the pad at its introduction into the forming apparatus.

The flatness of plate 65' has now forced the pad back to a perfectly flat position as indicated at 88 in Fig. 14. The stitching has been so located, however, that when the pad is flattened it subjects the tubular gauze wrapper 89 to some tension, tightly drawing the seam 90 toward the face of the pad. At 91 the core member ends and the continuously operating gauze tube with enfolded pads is drawn from it, leaving the pad restored to its original form and completely unsupported but tightly wrapped as shown in Fig. 15.

The motion of the gauze and pads through the forming and stitching apparatus is developed entirely in the pulling devices shown at H in Fig. 1. Each of these includes a pocket wheel or drum 910 having notches in its periphery registering with successive pads. The gauze is so guided as to pass at least partially around the periphery of the appropriate pocket wheel, thereby receiving considerable frictional driving force from the drum without subjecting the pads to undue pressure for the reason that each pad is received in one of the pockets. The arrangement corresponds to that disclosed in my Patent 2,131,808 except that for the purposes of the present invention the pocket wheels 910 rotate on vertical axes, the pads being still on their sides.

Immediately beyond the pocket wheels the tubular gauze wrapper is twisted ninety degrees as clearly shown in Fig. 1 to restore the pads to horizontal positions. In their progress through the several shears at I and the folding devices J and K, the treatment given the napkins is essentially that of the aforesaid companion case. However, since pads are moving synchronously through each of the several assembly lines it is possible to operate all the shears at I with one controlling device and actuator, and similarly the several slides used in the enfolding mechanism at K can be operated synchronously with one control and one actuator.

The sanitary napkin before the end folds are made as shown in Fig. 16, corresponds to the disclosure in my application 130,686. It comprises the gauze wrapper 89 shown in section in Fig. 15 on the face of which there is a chain stitched seam at 90 drawing the wrapper under tension about the contained pad, the form of which is apparent at 88 in Fig. 16. Since the gauze tube is severed between pads by the cut-off mechanism at I, there will be projecting beyond each pad a length 92 of gauze wrapper comprising a supporting tab. Since the gauze tube is initially con-

tinuous and the stitching thereof was continuous, the seam 90 will extend clear to the ends of the wrapper at the extreme margins of the tabs 92. As already indicated, the stitch used is preferably a chain or loop stitch, so that the disposal of the napkin is facilitated and it is possible to grasp one end of the thread and readily unloop it to disengage it completely from the wrapper, thereby opening up the wrapper and fully exposing the pad for disposal.

In the folding mechanisms the end tabs 92 are folded neatly over the pad to complete the assembly of the napkins, and from each assembly line the several completed napkins designated at 93 in Fig. 17 will be delivered on to the receiving table 94 in the path of the several lugs 95 of the conveyor chain 96. This chain will move the pads successively into the mouth of the stacking hopper 97 which comprises a tube having a cross section similar to the outline of the completed napkin and extending curvilinearly about the bend at 98 to the packaging table 99. The housing ends flush with such table.

One side of hopper 97 is open, and in the opening operates the stacking conveyor 100 which is a chain operating over sprockets 101 and 102 so located that the chain progressively recedes from the path of the napkins packed in the hopper. The chain carries packing arms 103 and has means for driving it at such a rate that one napkin is received upon each arm. As the chain moves to advance the napkins downwardly in the hopper 97 the arms are progressively withdrawn as clearly appears from Fig. 17 until finally the napkins are successively deposited upon each other in the hopper. Before a given arm is completely withdrawn from the hopper it will bear upon the upper surface of the napkin last deposited to advance the whole stack through the hopper, thus causing the remote end of the stack to project above the packaging table 99.

The chain 104 drives from sprocket 101 a cam 105 which periodically engages the cam follower 106 to operate the push plate 107 across the discharge end of the hopper housing, thereby thrusting on to table 99 all of the napkins which have already emerged from the housing. Ordinarily the timing will be such that the cam will function each time twelve napkins have been ejected, thus moving successive stacks of twelve napkins each across the packaging table where they can readily be placed in boxes. The principle of the stacker at L as just described is quite similar to that of the stacker disclosed in my Patent 2,131,808 but the device is specifically different, being simplified and adapted for receiving the product of three separate assembly lines.

Thus both at the beginning and the end of my machine there is only a single assembly line, but throughout the portion of the machine in which the folding, wrapping, and stitching occurs I divide the material between a plurality of assembly lines so as to maintain a high total output while requiring only a very low speed through the more delicate mechanisms. This avoids clogging and yet gives greatly increased output in but slightly increased floor space as compared with conventional machines previously known.

I claim:

1. In a sanitary napkin machine, the combination with means providing a plurality of sanitary napkin assembly mechanisms, of a pad material feeder, a single pad cutter having means for the operation thereof at a rate sufficient to supply all of said lines, and a distributing conveyor leading

from said cutter to the several mechanisms for distributing successive pads thereto.

2. The combination with a pad blanking die and means for feeding a web of filling material thereto, of a conveyor system arranged to receive pads from said die and including a plurality of separate branch conveyors, separate sanitary napkin assembly mechanisms served by the respective branch conveyors, and a single stacking device including a conveyor arranged to receive completed napkins from the several mechanisms for delivery of such napkins to a single discharge point.

3. In a sanitary napkin machine, the combination with a pad blanking die, of conveyor means leading from said blanking die, said conveyor means including mechanism for turning pads on edge, folding blades disposed on edge in the path of pad advance, a gauze supply guide upright before said blades adjacent such path, and a gauze puller beyond said blades adjacent such path, whereby to pull gauze over said guide and past said blades, and means for actuating said puller substantially at the rate of pad advance, whereby to enfold successive pads in the gauze while the gauze and pads are advancing on edge past said folding blades.

4. In a sanitary napkin machine, the combination with a sewing head and table, of means for supplying flat sanitary napkin pads, means for turning said pads to positions substantially at right angles to said table, means for enveloping said pad in a wrapper, and means for feeding the margins of the wrapper on to said table in operative relation to the stitching head.

5. In a sanitary napkin machine, the combination with means for feeding a web of gauze, of means for feeding successive pads in spaced relation and to a face of said web, a forming throat including a bar along which successive pads move, and a housing for folding the web and pads about the bar, said housing being slotted to permit the margins of the web to project therefrom, and means for stitching such margins together outside said housing at a point such that when said pad is released by said housing and flattened the web will be under tension about the pad with its seam on the face thereof.

6. In a device of the character described, the combination with a guide member having its sides gradually rounding toward one end of said member to comprise a slotted tube, a sewing head adjacent the slot of said tube, and an internal support extending along said member and through said tube, said support being free at the said end of said tube.

7. In a device of the character described, the combination with a forming member having its sides gradually curving toward one end of said member to comprise a split tube, of a plate in spaced relation to the other end of said member and having a bar-like extension through said tube about which a sanitary napkin pad can be folded within the tube, means supporting said plate and extension adjacent the last mentioned end of said member, and a portion of said extension at the first mentioned end of said member being free.

8. In a device of the character described, the combination with a forming member comprising a split tube and a bar extending therethrough, of means adjacent one end of the tube for supporting the bar, and the other end of the bar extending from said tube and comprising an unsupported flattening element.

9. In a device of the character described, the combination with a forming member comprising a split tube and a bar extending therethrough, of means adjacent one end of the tube for supporting the bar and the other end of the bar extending from said tube and comprising an unsupported flattening element, and means for drawing the gauze, and pads into said tube past the supported end of the bar, the size and shape of the tube being such as to fold each pad lengthwise about the gauze, said flat element being adapted to flatten the pad upon its emergence from the tube.

10. In a device of the character described, the combination with a sewing head having a horizontal table, of a split tube having its slot adjacent said table and directed toward said sewing head, a guide plate having its sides curving to emerge with said tube, a supporting plate in spaced relation to said guide plate, means for feeding gauze on edge across said guide plate, means for feeding pads on edge on to the face of said gauze to be retained thereon by said supporting plate, a rod-like extension from said supporting plate to said tube about which successive pads are folded in traversing the tube, the folding of the pads permitting projection of the side margins of the gauze on to said table in the path of said sewing head to be stitched together thereby, and means carried by said rod projecting from the delivery end of the tube for flattening successive pads upon emergence therefrom.

11. In a device of the character described, the combination with a pair of spaced plates and means for feeding a web of wrapping material between said plates across the face of one of said plates, means for feeding a succession of pads of filler material between said plates adjacent the face of the other plate, the first plate having its side margins progressively curving about the second plate to comprise a slotted rib and the second plate having its cross section progressively approaching that of a circular bar within said split tube, a stitching head adjacent the slot in said split tube, and means carried by said bar and otherwise unsupported beyond said split tube for flattening the pads on emergence from the restraint of said tube.

12. In combination in a device of the character described, a first plate having a channel, means for feeding a web of wrapping material along said plate to take the form of the channel thereof, means for feeding successive pads on to the face of the wrapping material, a complementary plate so positioned with reference to the first mentioned plate as to force the pads and wrapping material into the channel, whereby partially to envelop each successive pad in wrapping material, wings carried by the first mentioned plate, means for drawing the margins of the wrapping material outwardly along said wings, said wings being progressively extended closer to each other about the second plate and the second plate being progressively varied in cross section to reduce its width materially less than that of the pad, the channeled plate being correspondingly curved about the changed cross section of the second plate to fold the pad thereover, a slotted tube comprising an extension of the first plate and the wings thereof, a bar within said slotted tube comprising an extension of the second plate and about which each successive pad is longitudinally creased and enveloped in wrapping material, a sewing head adjacent the slot of the split tube, and means for actuating said sewing head

upon the projecting margins of wrapping material, whereby to produce a substantially continuous seam, means for drawing the wrapping material and enveloped pads from the end of the split tube, and means for flattening the successive pads to draw the seam of the wrapping material on to the face thereof.

13. In a device of the character described, the combination with means providing a channel and means for feeding a web of wrapping material along the channel, of a plate complementary to said first mentioned means spanning the mouth of the channel, means for feeding pads between said plate in the channel, whereby to force the wrapping material into the channel and partially about the pad, means opposite said channel for the support of said plate, a split tube comprising an extension from said channel, and a rod comprising an extension of said plate and extending otherwise unsupported into said tube, said split tube having such dimensions and form with reference to said channel as to fold about said rod the pads fitting said channel.

14. In a device of the character described, the combination with means providing a channel and means for feeding a web of wrapping material along the channel, of a plate complementary to said first mentioned means spanning the mouth of the channel, means for feeding pads between said plate in the channel, whereby to force the wrapping material into the channel and partially about the pad, means opposite said channel for the support of said plate, a split tube comprising an extension from said channel, and a rod comprising an extension of said plate and extending otherwise unsupported into said tube, said split tube having such dimensions and form with reference to said channel as to fold about said rod the pads fitting said channel, said rod extending beyond said tube and being provided externally thereof with a flattening device in the path of the successive pads for enfolding them.

15. In a sanitary napkin machine, the combination with a plurality of separate mechanisms for enfolding pads in gauze, cutting the gauze and delivering completed sanitary napkins, of means for the synchronous operation of said mechanisms for the substantially simultaneous delivery of completed napkins therefrom, and a cross conveyor mechanism arranged to receive the several napkins from the several mechanisms, and means for stacking the several napkins in a common stack.

16. In a sanitary napkin machine, the combination with a plurality of mechanisms for the assembly of sanitary napkins and means for the substantially synchronous operation of said mechanisms for the substantially simultaneous discharge of completed sanitary napkins therefrom, of a common conveyor arranged to receive the napkins discharged from the several mechanisms, and a single stacker to which said conveyor delivers the napkins from all of said mechanisms, said stacker being arranged to pack said napkins successively in stacks.

17. In a device of the character described, the combination with a gauze puller and pad feeder, of means for delivering a web of gauze to the successive faces of pads delivered from said feeder, and a folder comprising a throat open to receive the gauze and successive pads and having progressively convergent wall portions along the path of pad and gauze advance, whereby to force toward each other the side margins of a pad advancing therethrough, said throat

having a slotted tubular portion through which margins of the gauze and web project beyond the constricted pad, and a sewing head adjacent the slot of the tube in the path of the margins of the gauze web projecting through said slot and adapted to stitch such margins together about the constricted pad.

18. In a sanitary napkin machine, the combination with a gauze web feeder, of means for feeding successive pads in spaced relation to a face of said web, means for advancing the web and pads together, and a forming throat comprising a laterally slotted housing from which the margins of the web project, said housing being open at one end to receive the gauze and the substantially flat pads and thence comprising a progressively constricted throat interiorly conforming in cross section to the transverse dimensions of a longitudinally folded pad, whereby each successive pad is folded in traversing said throat, together with a sewing head positioned adjacent the slot of said housing at said throat and adapted to stitch together projecting margins of the gauze web as the longitudinally folded pad within the web is traversing the throat, whereby to constitute the web a tube wherein successive pads are encased.

19. The combination with pocketed means for pulling a web of gauze and enfolded pads, of mechanism for continuously stitching said gauze web into a tube about the pads enfolded therein in the course of movement of said gauze and pads to said pulling means, said mechanism comprising a gauze feeder, a pad feeder arranged to deliver pads successively at spaced intervals to the face of gauze delivered by said gauze feeder, a laterally slotted forming throat in the path of gauze and pad advance between said feeders and said pulling means, and a sewing head adjacent the slot of said throat, said throat having a receiving opening of such dimensions as to receive a substantially flat pad and adjacent portions of the gauze web and being progressively constricted beyond said opening toward said sewing head to a form

corresponding with the shape of the pad when longitudinally folded, and bar means within said throat co-acting therewith for the folding of a pad therein in the course of its movement with the gauze therethrough.

20. In a sanitary napkin assembling machine, the combination with means for feeding a web of filling material, of a blanking die operating transversely of the web for blanking napkin pads from successive end portions of the web, a distributing table arranged to receive the pads from said die, and conveyor means for turning the pads upon the table while advancing them thereover, and co-acting conveyor means for delivering successive pads across said table to different discharge points thereon.

21. In a sanitary napkin assembling machine, the combination with means for feeding a web of filtering material, of a blanking die operatively positioned in the path of web advance for blanking napkin pads from successive end portions of the web, a distributing table arranged to receive the pads from the die, a plurality of separate sanitary napkin assembling mechanisms including separate gauze feeders, and cross conveyor means operating for the delivery of successive pads transversely of said table to the several mechanisms.

22. In a sanitary napkin assembling machine, the combination with a plurality of gauze supply means and a plurality of separating mechanisms for the assembly of pads in the gauze supplied by the several means, of a single source of pads for the several mechanisms comprising means for feeding a web of filling material, a blanking die positioned in the path of web advance and operatively connected to the blank pads from successive end portions of the web, and a distributing conveyor system in operative connection between said blanking die and the several assembling mechanisms for the distribution of successive pads between the several mechanisms.

CURT G. JOA.