May 27, 1969 N. J. FRANZ 3,445,897

METHOD OF MAKING SANITARY NAPKINS AND THE LIKE

Filed Feb. 23, 1967

Sheet 1 of 2

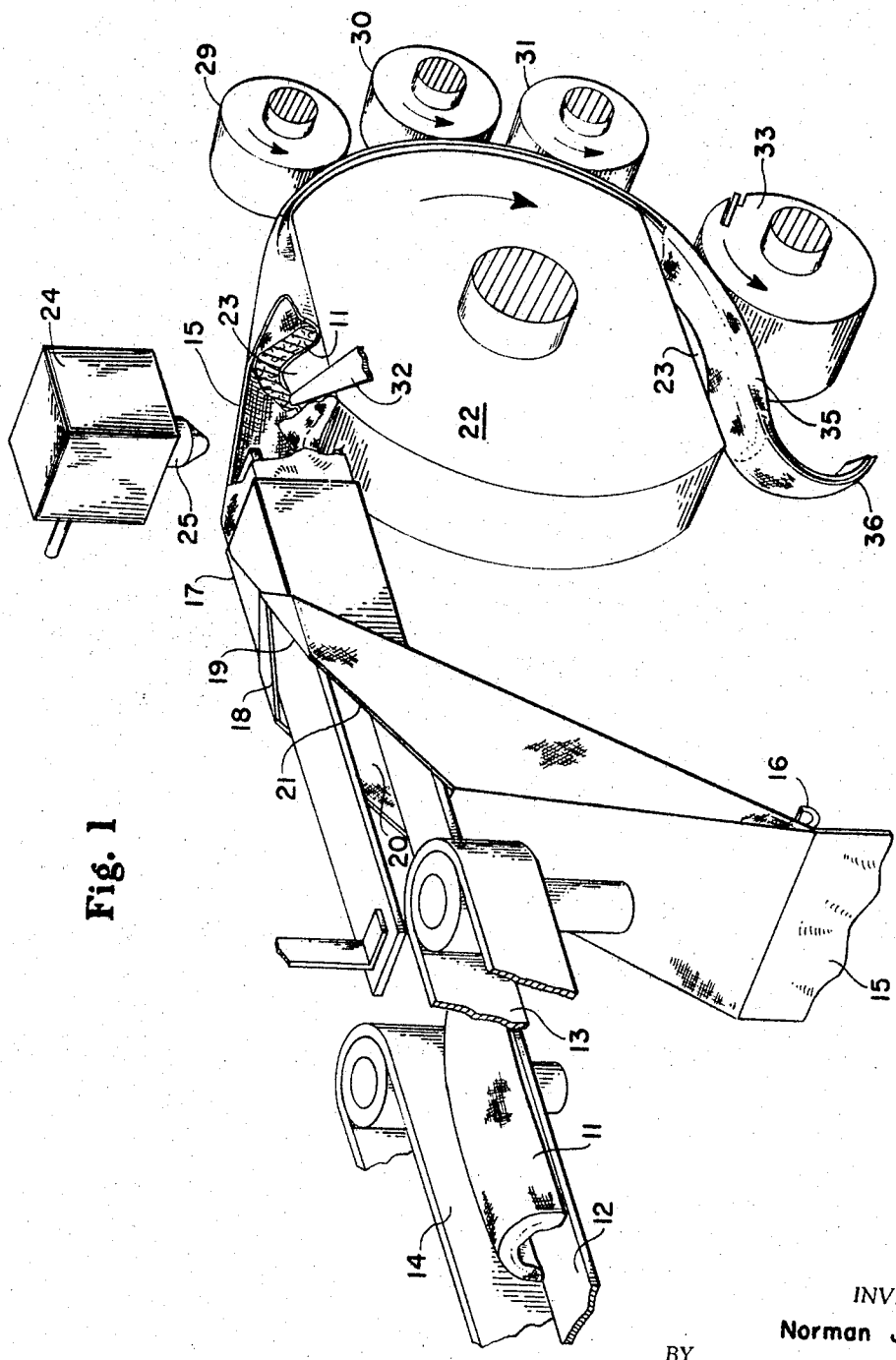


Fig. 1

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Sheet 2 of 2

Fig. 2

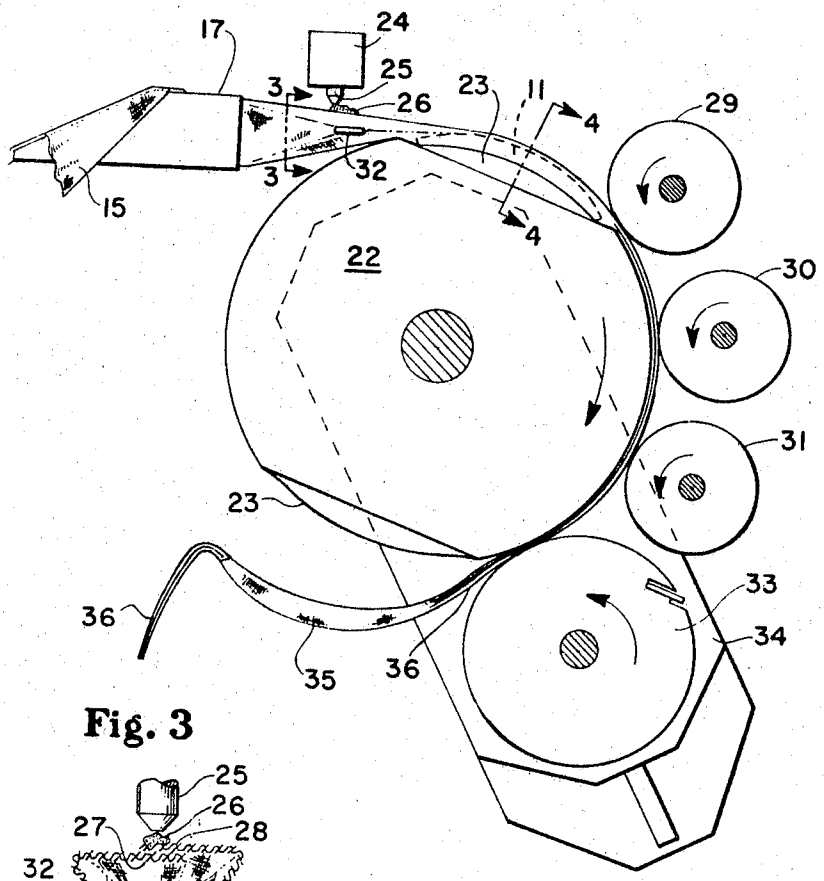


Fig. 3

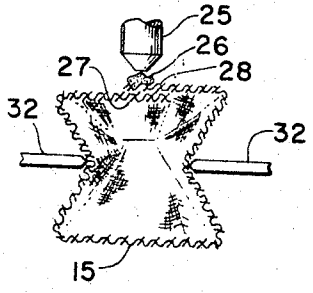
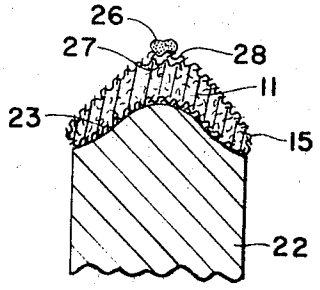


Fig. 5

Fig. 4



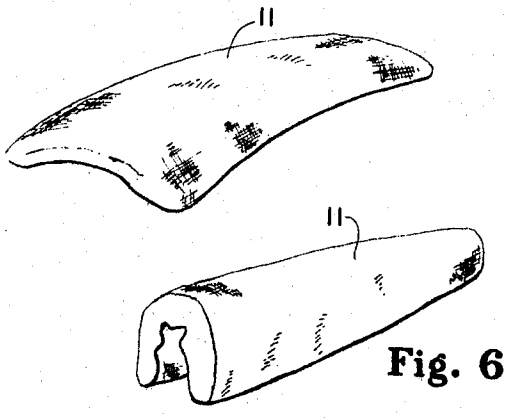


Fig. 6

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METHOD OF MAKING SANITARY NAPKINS AND THE LIKE

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Int. Cl. A61l 15/00; A61f 13/18
U.S. Cl. 19—144.5
7 Claims

ABSTRACT OF THE DISCLOSURE

A method of making sanitary napkins having arcuately-shaped cores by folding the core longitudinally, whereby it assumes an essentially flat and straight form. An outer wrapper of fabric material is folded around the core such that the longitudinal edges of the wrapper are overlapped. The folding pressure on the core is then released thereby allowing the core to reassume its original shape. An adhesive applied to the overlapped edges adheres the outer wrapper to maintain the components in assembled relationship.

This invention relates to a method of making sanitary napkins and the like. The invention is particularly adapted for the making of sanitary napkins having a preformed arcuately-shaped absorbent core such as a product as described and claimed in the application Ser. No. 545,689, entitled, Sanitary Napkin, filed Apr. 27, 1966, by Donald R. Megison and Stanley Barton (referred to hereinafter as the Megison et al. application).

The need for a unique method of making sanitary napkins became apparent when the problem of forming napkins of the kind described in the aforesaid Megison et al. application was initially considered. The use of a preformed, arcuately-shaped absorbent core made it quite difficult to form the outer wrapper neatly and snugly around the core in anything that even approached commercially acceptable production speeds. Because of the arcuate core shape, the outer wrapper of soft and pliant nonwoven material necessarily had to be carefully wrapped and formed around the curved core in order to obtain an acceptable neatly wrapped product. This forming sequence was tedious and time consuming and did not readily lend itself to the application of previously known high speed production methods that were conventional in the production of sanitary napkins.

It is therefore a principal object of this invention to obviate the problems presented in the making of sanitary napkins having an arcuately-shaped core.

Another object of the invention is the provision of a method of forming sanitary napkins having arcuately-shaped inner core members at relatively high production speeds without any permanent deformation of the core.

Still another object of the invention is the provision of a method as aforesaid which can be practiced continuously by the application of a sequence of manipulations to obtain a satisfactory product in a most unexpected way.

The nature and substance of the invention can be summarized briefly as comprising a method of making arcuately-shaped sanitary napkins from a preformed absorbent core of unitary construction, the core being arcuately-shaped on its longitudinal dimension by first folding the core on its longitudinal dimension such that its arcuate curvature is substantially decreased without imparting any permanent deformation thereto, and then folding a fabric wrapper material around said core such that the longitudinal edges of the wrapper material are overlapped. On releasing the folding pressure applied to the core, its inherent resiliency restores it to its original shape to fill out the overwrap material in a smooth and snug overwrapper without disturbing the overlapped longitudinal edges. The lapped longitudinal edges of the overwrap material are adhered either before, during or after the core is restored to its original shape to complete the assemblage.

While the specification concludes with claims particularly pointing out and distinctly claiming the subject matter regarded as forming the present invention, it is believed the invention will be better understood from the following description taken in connection with the accompanying drawings in which:

FIGURE 1 is a perspective view of an apparatus shown schematically that can be used in carrying out the method of this invention.

FIGURE 2 is a side elevation of the apparatus shown in FIGURE 1.

FIGURE 3 is a fragmentary cross section taken on the line 3—3 of FIGURE 2.

FIGURE 4 is a fragmentary cross section taken on the line 4—4 of FIGURE 2.

FIGURE 5 is a perspective view of the arcuately-shaped sanitary napkin core.

FIGURE 6 is a perspective of the core of FIGURE 5 after it has been folded on its longitudinal dimension.

The present invention is particularly useful in the formation of sanitary napkins from preformed cores of arcuate-shape. The cores are absorbent and have a fleecy wrapper covering (i.e. a thin, soft, compliant, absorbent, fibrous batt). Further details of the materials of the core and its structure may be found by reference to the aforesaid Megison et al. patent application.

As seen in FIGURE 1, the arcuate-shaped cores **11** are initially folded over on their longitudinal dimension. This results unexpectedly in a substantial decrease in the arc of curvature in the long dimension to the extent that the folded core is essentially flat and straight. FIGURES 5 and 6 illustrate the core before and after folding. The folded core is placed upon the dead plate **12** between the folder belts **13** and **14** which carries the folded core forward while simultaneously maintaining it in folded condition.

An outer wrapper in the form of a web **15** is fed and folded continuously around a series of spaced cores in the manner to be hereinafter described. The web **15** of outer wrapper material is preferably fed from a suitable roll (not shown). Preferably, the wrapper **15** is a thin, flexible fabric material that is sufficiently wide to encircle the transverse dimension of the core **11** with slight overlap of the longitudinal edges of the web **15**. This permits the longitudinal edges to be subsequently united by the use of an adhesive or the like. The web **15** can be a fabric such as gauze, a knitted scrim, or, preferably, it may be a bonded non-woven material, which is smooth, soft, porous, liquid permeable, non-pilling, and adapted to cover a curved object. Additional details of the wrapper material **15** are found in the previously cited Megison et al. application.

The wrapper **15** is fed over the guide **16** and then around and partially through a folder **17** to ensleeve the folded cores **11** being moved forward and fed continuously at spaced intervals by the belts **13** and **14**. The edges **18** and **19** of the folder **17** cause the longitudinal edges of the wrapper **15** to be folded over and overlapped as the wrapper **15** moves forward continuously. Simultaneously, the cores **11** are fed forward so that the forward end, supported by the deadplate **12**, is engaged by the side walls **20** and **21** of the stationary folder **17**. The wrapper material **15** moving on the inside surfaces of the side walls **20** and **21** contacts the core **11** because of the inherent tendency of the core to resiliently restore itself to its original shape. This carries the core forward within the ensleeving outer wrapper **15** such that on discharge from the

stationary folder **17**, the folded core **11** is entirely encircled by wrapper material **15**, which is overlapped along its longitudinal edges as it leaves the upper portion of the folder **17**.

A pocketed roll **22** is supported for rotation on its extending shaft by suitable and conventional means (not shown). The pocketed roll **22** has spaced convex surfaces **23** that are recessed in the peripheral surface of the roll. The convex surfaces **23** are longitudinally and transversely convex to receive the overwrapped core **11** after it restores itself to its original shape on emerging from the folder **17**. The convex surfaces **23** are shaped to conform to the desired finished contour of the sanitary napkin (see FIGURES 2 and 4). The cores **11** are fed to and through the folder **17** in timed relation to the rotation of the roll **22** such that each successive core **11** arrives over one of the convex surfaces **23** of the roll **22** to be carried thereon in its fully restored condition.

An adhesive applicator head **24** having an applicator nozzle **25** projecting downwardly therefrom is mounted over the assemblage just beyond the folder **17**, as best illustrated in FIGURE 2. A conventional, commercially available hot melt adhesive is continuously discharged from the nozzle **25** to be deposited in the form of a bead **26** on the overlapped portions **27** and **28** (see FIGURE 3) of the wrapper **15** which is moved forward continuously. For convenience, the drawings illustrate the bead **26** as being deposited on the overlapped edges **27** and **28** after the core is restored to its original shape. This is not critical, as the bead can be deposited on the overlapped edges either before, during, or after restoration of the core **11** to its original shape.

A plurality of chill rolls **29**, **30**, and **31**, are provided to bear against the pocketed roll **22** (see FIGURES 1 and 2). The chill rolls are suitably supported by conventional means (not shown). The chill rolls are preferably cooled substantially below room temperature such that they will tend to chill and set the adhesive bead **26** previously deposited on the overlapped portions **27** and **28** of the wrapper **15**. In addition, the rolls **29**, **30**, and **31** are preferably cooled sufficiently to normally form a thin film of condensate thereon, as it has been found that this prevents adhesion of the adhesive with the rolls and keeps the rolls clean and free of foreign matter. The tension of the rolls **29**, **30** and **31** against the recessed roll **22** is sufficient to continuously draw the outer wrapper material **15** through the stationary folder **17**.

Pleating members **32** are provided on either side of the pocketed roll **22** (see FIGURES 1, 2 and 3) in approximately the position shown in the drawings. These members are alternately withdrawn when a core member passes between them and then moved inwardly to form a pleat in the outer wrapper material between the passage of each core. In some cases the roll **31** can be heated so that it will hot press the pleats formed intermediate the core portions.

A cutter roll **33**, as seen in FIGURES 1 and 2, is provided and may be suspended from the arm **34** (FIGURE 2) to continuously cut successive finished sanitary napkins **35** from the assemblage. The cutter roll **33** is driven in timed relationship such that suitable end extensions **36** are provided on each completed sanitary napkin **35** as shown in FIGURE 2. Thus on each revolution of the cutter roll **33**, a finished sanitary napkin **35** of the type described in the Megison et al. application is completed.

While particular embodiments of the invention have been illustrated and described, it will be obvious to those skilled in the art that various changes and modifications can be made without departing from the spirit and scope of the invention and it is intended to cover in the appended claims all such changes and modifications that are within the scope of this invention.

What is claimed as new is:

1. A method of manufacturing sanitary napkins from an absorbent core having a substantial arc of curvature on its longitudinal dimension comprising the steps of

(a) decreasing substantially the arc of curvature by folding over said core longitudinally on itself so that it becomes essentially flat and straight.

(b) moving said folded core forward and maintaining it in its folded over condition,

(c) forming a fabric overwrap material around said folded core while it is in essentially flat and straight condition to encircle the transverse dimension of the core and overlapping slightly the longitudinal edges of said overwrap material,

(d) releasing said core from its folded condition to permit restoration to its original arc of curvature within said overwrap, and

(e) depositing a bead of adhesive on the overlapped edges of the overwrap material.

2. A method of manufacturing sanitary napkins as claimed in claim **1** including the step of pleating the fabric overwrap material extending beyond the ends of the core.

3. A method of manufacturing sanitary napkins as claimed in claim **1** wherein the step of depositing a bead of adhesive on the overlapped edges includes depositing a bead of hot melt adhesive on said overlapped edges an thereafter chilling and setting the adhesive by passing the adhesive bead beneath at least one chill roll.

4. A method of manufacturing sanitary napkins as claimed in claim **3** including the step of pleating the fabric overwrap material extending beyond the ends of the core.

5. A method of manufacturing sanitary napkins as claimed in claim **1** including the step of placing said over-wrapped core on a longitudinally and transversely convex surface which conforms to the finished contour of the sanitary napkin prior to depositing an adhesive bead on the overlapped edges of the overwrap material.

6. A method of manufacturing sanitary napkins as claimed in claim **5** including the step of chilling and setting the adhesive bead by passing said bead beneath a chill roll.

7. A method of manufacturing sanitary napkins as claimed in claim **6** including the step of cooling the chilled roll sufficiently to form a thin film of condensate on its surface to prevent adhesion of adhesive to the roll.

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