

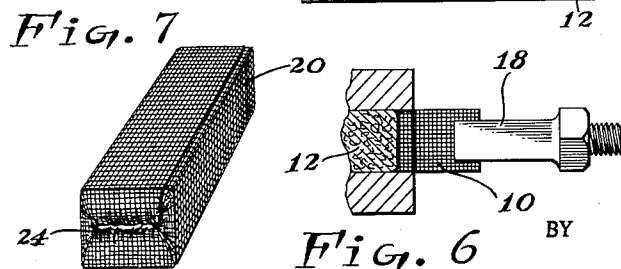
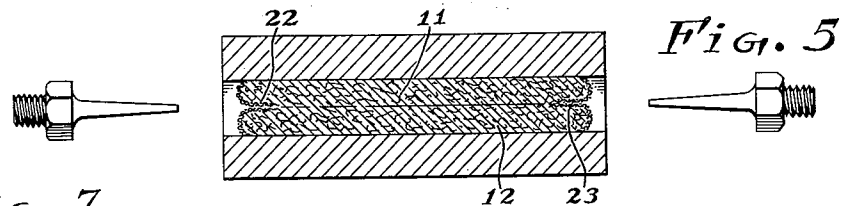
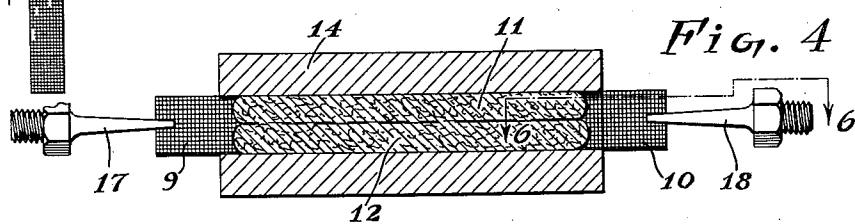
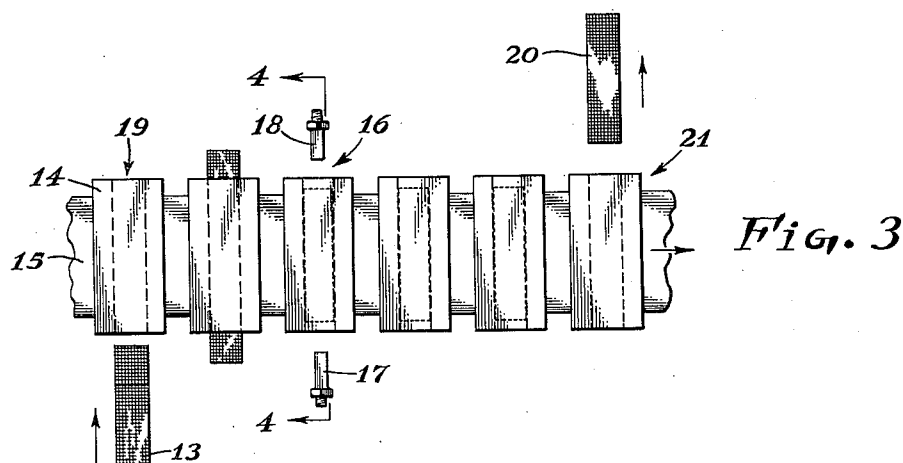
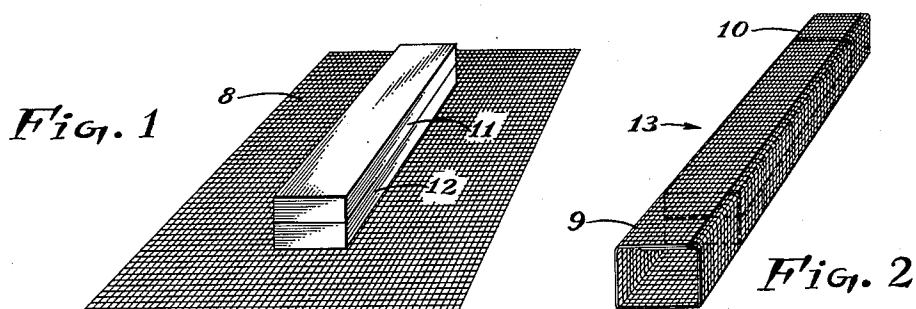
May 29, 1962

C. H. ROWE

3,036,344

MANUFACTURE OF CELLULOSIC PRODUCTS

Filed Nov. 10, 1958



1

3,036,344

MANUFACTURE OF CELLULOSIC PRODUCTS
 Carl Hess Rowe, Appleton, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis., a corporation of Delaware

Filed Nov. 10, 1958, Ser. No. 773,019
 8 Claims. (Cl. 19—144.5)

This invention relates to the manufacture of cellulosic products and more particularly to method and apparatus for manufacturing sanitary products such as tampons, sanitary napkins and medical sponges and bandages.

Sanitary products such as tampons, sanitary napkins and medical sponges and bandages are made of fibrous or other suitable material, and it is desirable that this material be enclosed in a cover of soft pervious material. In a preferred method of making these products, for example, tampons, an uncompressed fibrous body or filler is enclosed in a pervious cover and then highly compressed to a small size. Because of the fibrous and clinging nature of both the filler and cover materials, covering the fibrous mass or filler is a difficult operation to perform mechanically. The principal object of the present invention is to provide improved method and apparatus for tucking into a longitudinal end of a tampon filler the portion of a cover which extends beyond said end after the lateral sides of the filler have been enclosed by said cover, or for tucking such portions into both longitudinal ends. Another object is to provide method and apparatus for end tucking which is simpler and more rapid than previously known, and which require the minimum amount of mechanism.

According to the method of the present invention, after the lateral sides of a sanitary product filler, such as a tampon filler, have been enclosed in a cover which extends beyond both longitudinal ends of the filler, a thin stream of high velocity gas, preferably air, is directed into said longitudinal end to collapse the extending portion of the cover against the filler and force the outer edges of the extension into the filler to enclose said longitudinal end. Both longitudinal ends are preferably closed simultaneously in this manner.

Other objects and advantages of the invention will be apparent from the following description and the appended drawings wherein:

FIG. 1 shows a pair of batts of absorbent fibrous material stacked on a sheet of gauze cover material;

FIG. 2 shows the gauze enclosing the lateral sides of the stack with sleeve-like portions of the gauze extending beyond both ends of the stack;

FIG. 3 illustrates, schematically, a plurality of holders carried by a conveyor past and between a pair of inwardly directed tucking nozzles;

FIG. 4 is a vertical longitudinal section through one of the tampon holders at the tucking station, just before the ends of the gauze have been tucked into the tampon;

FIG. 5 shows the same immediately after the ends of the gauze have been tucked;

FIG. 6 is a fragmentary section taken on line 6—6 of FIG. 4; and

FIG. 7 shows a perspective view of a tucked tampon or "pledget."

Referring now to the drawings, there is shown in FIG. 1 a sheet of suitable pervious cover material such as gauze 8 upon which are disposed a pair of stacked batts of suitable fibrous absorbent material 11 and 12. FIG. 2 shows the sheet of gauze folded around the lateral sides of the stack 11, 12 and overlapped at the top to form a partially covered pledget 13 having tubular or sleeve-like portions 9 and 10 of the cover extending beyond the respective longitudinal ends of the filler.

The novel method of tucking end portions 9 and 10

2

into the filler according to this invention is to direct thin streams or jets of high velocity gas, preferably air, into the ends of the filler. This instantly collapses portions 9 and 10 against the ends, due to the reduced air pressure around the air stream, and drives the edges of portions 9 and 10 between batts 11 and 12. FIGS. 3 to 6 illustrate preferred apparatus for practicing this method.

FIG. 3 shows a plurality of holders 14 carried by suitable conveyor 15 past a tucking station 16 which is positioned between two inwardly directed nozzles 17 and 18. As indicated, untucked pledgets 13 are successively fed into the holders 14 at station 19, and tucked pledgets 20 are removed from the successive holders at station 21.

Nozzles 17 and 18 may be fixed, or may be movable to and from the operative positions shown in FIG. 3. It make no difference if the movement of holder 14 to station 16 brings gauge extensions 9 and 10 into contact with fixed nozzles, thereby partly folding in a side of each against the respective nozzle; the tucking operation described below is not interfered with by this.

The action at the tucking station 16 is illustrated in FIGS. 4 and 5. As may be seen by comparison of FIGS. 4 and 6, nozzles 17 and 18 are thin and comparatively broad at their discharge ends, and their orifices (not shown) are similarly proportioned. The nozzles are so aligned with the tubular holders 14 that they are pointed inwardly along the medial plane between batts 11 and 12, the breadth of the orifices being disposed along this medial plane.

When compressed air is supplied to nozzles 17 and 18 a high velocity stream or jet of air issues from these nozzles inwardly into the stack, tending to separate the batts. Simultaneously the extending portions 9 and 10 of the cover are drawn inwardly toward the jet streams, and collapsed against the opposite ends of the stacks. The same air streams draw the previously extreme outer edges of cover extensions 9 and 10 between batts 11 and 12 and tightly anchor them there, as indicated at 22 and 23 in FIG. 5. If desired, apertures may be provided through the walls of holder 14 to facilitate escape of the air, but with suitably pervious absorbent batts this is unnecessary in practice, the air escaping laterally through the batts and through the ends of the tampon pledget around the inwardly directed streams. Only a very short pulse of air is required, the change from the condition illustrated in FIG. 4 to that illustrated in FIG. 5 taking only a small fraction of a second. As illustrated in FIG. 7, the tucked tampon pledgets 20 have the ends of their covers securely tucked in as illustrated at 24.

Although the ends of a cover are held more securely when they are tucked between a pair of batts as illustrated above, it has been found that it is not essential that separate batts be used. Even if a single uncompressed fibrous mass be substituted for batts 11 and 12, the air jets will collapse the sleeve-like extensions upon the ends of this mass and drive the edges thereof into the ends of the mass. Of course, the nozzles would then preferably be of small dimension in both lateral directions, instead of being thin in only one direction and relatively thick in the other.

In some cases it may be desirable to tuck in only one end of an untucked pledget such as illustrated in FIG. 2. This may be done by using a single nozzle and a pocket with only one end, or by using a pocket such as 14 with additional means to hold the untucked pledget against longitudinal movement during the tucking operation.

The method according to the present invention may be performed by hand, for example by holding the untucked pledget of FIG. 2 in the hand and placing one end at a time into alignment with a thin stream of high velocity gas from any source. It also may be performed

in other apparatus, for example the untucked pledgets may be impaled on needles, or held in other forms of holders in place of pockets 14. The preferred apparatus could be used for other purposes, for example for treating material held in pockets with liquid or gaseous jets to apply a sterilizing fluid or a deodorant.

While the product illustrated in FIG. 7 has been described as a tampon, it will be obvious that it is equally suitable for use as, or as a component of, a sanitary napkin or a medial sponge or bandage.

It will be seen that the process and apparatus of the present invention give various advantages over methods and apparatus which use mechanical tools to gather inwardly the sleeve-like cover extension and then to force it into the untucked pledget. The mechanism is simpler. The tucking means requires no moving parts and operates almost instantaneously, thereby permitting more rapid production.

I claim:

1. The method of making a sanitary product which comprises enclosing the lateral sides of an absorbent body in a pervious cover having an extension with an outer edge projecting outwardly beyond a longitudinal end surface of said body, and directing a stream of high velocity gas into said longitudinal end surface, normal thereto, and from a distance such as to collapse said extension against said body and drive said outer edge into said body.

2. The method of making a sanitary product which comprises enclosing the lateral sides of an absorbent body in a pervious cover having extensions projecting outwardly beyond the respective longitudinal end surfaces of said body, each of said extensions having an outer edge, and directing a thin stream of high velocity gas into each respective longitudinal end surface, normal thereto, and from a distance such as to collapse said extensions against said body and drive said outer edges into said body.

3. The method of making a sanitary product which comprises placing a pair of flat absorbent batts in a stack in face to face relationship on opposite sides of a medial plane, partly enclosing said stack in a pervious cover which surrounds the lateral sides of said stack between two end sides thereof and has a portion which extends beyond one of said end sides, said portion having an outer edge, and directing a thin stream of high velocity gas into said one of said end sides along said medial plane from a distance such as to, collapse said portion against said stack and drive said outer edge between said batts.

4. The method of making a tampon which comprises placing a pair of flat absorbent batts in a stack in face to face relationship on opposite sides of a medial plane, partly enclosing said stack in a pervious cover which surrounds the lateral sides of said stack between two opposite end sides thereof and extends beyond said end

sides in tube-like portions, one at each end, each of said portions having an outer edge, and directing a thin stream of high velocity gas into each of said end sides along said medial plane from a distance such as to collapse said portions respectively against said end sides and drive said outer edges between said pair of batts.

5. Apparatus for tucking into an end of a partly enclosed sanitary product an extension of a pervious cover, the lateral sides of said product being enclosed in said cover with said extension projecting outwardly beyond said end, comprising a holder, said holder having a cavity with an open end, said cavity having a central axis extending through said open end, said holder being adapted to hold said partly enclosed product in said cavity with said extension projecting out of said open end, a nozzle, and means for bringing said holder and nozzle into juxtaposition, with said nozzle pointed along said axis and into said open end.

6. Apparatus for tucking into the opposite longitudinal ends of a partly enclosed tampon the extensions of a pervious cover, the lateral sides of said tampon being enclosed in said cover with said extensions projecting outwardly beyond the respective longitudinal ends of said tampon, comprising a tubular pocket open at both ends, said pocket being adapted to hold said partly enclosed tampon with said extensions projecting respectively out of the open ends of said pocket, a pair of thin nozzles, means for supplying gas under pressure to said nozzles, and means for bringing said pocket and nozzles into juxtaposition with each said nozzle pointed into a different one of the open ends of said pocket.

7. The method of tucking into a pervious body the outer edge of an extending portion of a pervious wrapper, said wrapper partly enclosing said body, which comprises directing a thin stream of high velocity gas into said body through and normal to a surface thereof adjacent said extending portion from a distance such as to collapse said portion upon said body and drive said outer edge into said body.

8. Apparatus for tucking into an end of a partly enclosed pervious body an extension of a pervious cover, the lateral sides of said body around said end being enclosed in said cover with said extension projecting outwardly beyond said end, comprising means for holding said partly enclosed pervious body with said extension projecting therefrom, and means for directing a jet of high velocity gas into said end adjacent said extension and in a direction parallel thereto.

References Cited in the file of this patent

UNITED STATES PATENTS

1,600,320	Danquigny	Sept. 21, 1926
2,566,190	Greiner et al.	Aug. 28, 1951
2,747,346	Tigerman et al.	May 29, 1956

UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,036,344

May 29, 1962

Carl Hess Rowe

It is hereby certified that error appears in the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 2, line 16, for "make" read -- makes --; lines 24 and 25, for "(not shown" read -- (not shown) --; column 3, line 10, for "medial" read -- medical --; same column, line 47, after "to" strike out the comma.

Signed and sealed this 11th day of September 1962.

(SEAL)

Attest:

ERNEST W. SWIDER
Attesting Officer

DAVID L. LADD
Commissioner of Patents