Dec. 5, 1950 H. C. A. BEHR 2,532,438

PROCESS FOR SEVERING OF CONNECTED TAMPONS

Filed April 15, 1947

Fig. 1.

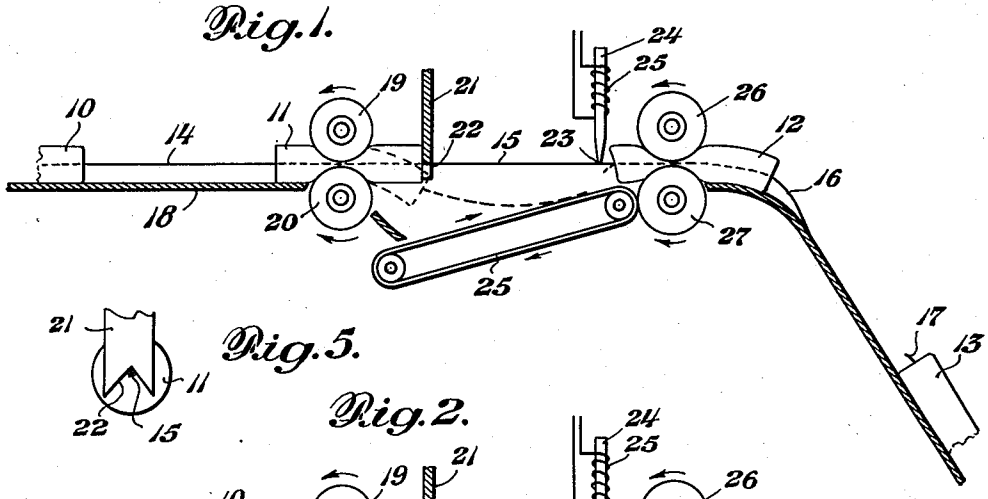


Fig. 5.

Fig. 2.

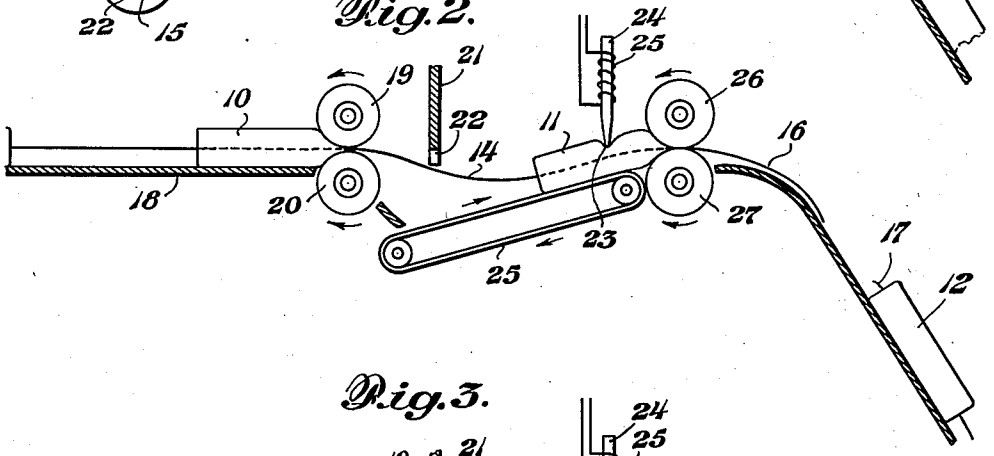
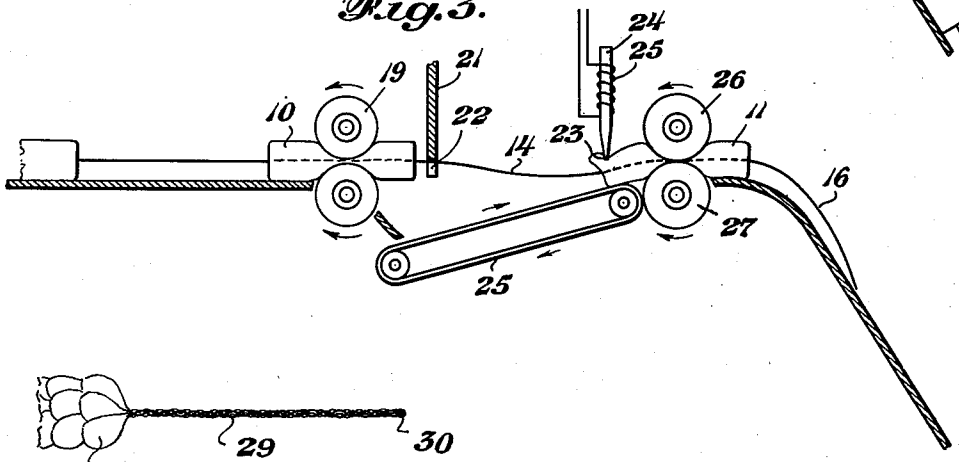


Fig. 3.



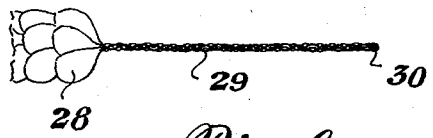


Fig. 4.

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PROCESS FOR SEVERING OF CONNECTED TAMPONS

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4 Claims. (Cl. 154—125)

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The present invention relates to tampons and the manufacture thereof. More particularly the present invention relates to a novel tampon provided with a plastic cord structure and the severance of individual tampons from a connected series of such tampons at timed intervals so as to provide each severed tampon with a relatively long withdrawal string and a relatively short section.

In the production of tampons by various processes some of which involve continuous stitching of a series of spaced portions of cotton by a cord member so as to provide a continuous cord connecting a series of spaced cotton wads and other processes which involve the simultaneous fabrication of the cotton and the string, the product comprises a series of wads which were connected by a cord conventionally of cotton. In this connection attention is directed in particular to U. S. Patent 2,401,284, granted May 28, 1946, to Courtney P. Winter and Dunbar A. Rosenthal, which discloses a process for the production of tampon structures by a braiding operation which provides bunches of cotton forming a cotton wad connected by a series of string or cord members. In the severance of a structure of this type, it has been found extremely difficult to sever and separate tampons so that the cord is severed adjacent a preceding wad to thereby produce the longest possible withdrawal string attached to each succeeding wad of cotton. The connected tampon structures, as may be understood, are relatively loose prior to their compression and portions of cotton tend to become entangled and incorporated with the string proper. Any timing deficiency of a conventional knife structure therefore results in the severance of the loose cotton or the severance of the string between the cotton bunches to provide an abnormally short withdrawal cord.

In addition to the foregoing the provision of a conventional cotton string has been found undesirable inasmuch as such a cotton string is highly capillary and wettable under conditions of use and such wetting and swelling of the string has been found undesirable.

It is one of the objects of the present invention therefore to provide a novel tampon structure and/or series of tampon structures connected by a suitable plastic cord capable of readily fusing and severance by a heated severing member.

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A second object of the present invention is to provide a novel process for the severance of individual tampons from a continuous string of such tampon structures united by a cord.

A third object of the present invention is to provide a novel process for the severance of tampon structures united by a heat fusible cord involving a heated member heated to such a temperature that the cord will be fused and severed thereby and the cotton intermediate the cord substantially unaffected.

A fourth object of the present invention is to provide a novel tampon including a withdrawal cord of a non-hydroscopic, moisture impenetrable plastic nature.

Still another object of the present invention is to provide for the perfect timing of severance of individual tampon structures from a continuous string of such structures united by a suitable cord.

Other objects and the nature and advantages of the instant invention will be apparent from the following description taken in conjunction with the accompanying drawings, wherein:

Figure 1 is a diagrammatic illustration of one form of the apparatus according to the present invention.

Figure 2 is a view similar to Figure 1 with the tampons in a different position.

Figure 3 is a view similar to Figures 1 and 2 with the tampons in a third position.

Figure 4 is a detail of one of the severed tampon structures.

Figure 5 is a detail illustrating the stop member.

Referring to the figures of the drawing and particularly Figure 1 thereof, a series of tampons are indicated at 10, 11, 12, and 13, respectively. The tampons 10 and 11 are connected initially by a cord member 14 and the tampons 12 and 13 by the cord member 15. The tampon 12 as shown is provided with a severed cord withdrawal member 16 and the tampon 13 as shown is provided with a fragmentary portion of cord 17. The string of tampons, and particularly the tampons 11 and 12, is initially supported as by a table indicated diagrammatically at 18, and are moved over the surface of the table 18 by the rolls 19

and 20 which are suitably rotated as indicated by the arrows in such manner as to advance the tampon 11 positioned therebetween.

Adjacent the rolls 19 and 20 is a stop member 21 provided with a notch 22 as best shown in Figure 5. The tampon 11 in Figure 1 is shown as abutting the stop member and the cord 15 extends through the apex of the notch 22. This serves to tension the cord 15 which is attached at this time to the tampon 12 and a portion of the cord at 23 is brought into contact with the hot severing member 24 provided with the heating coil 25. The cords 14, 15, etc. are all of a suitable fusible plastic substance and the contact thereof with the severing member 24 serves to sever the cord 15 so that it falls onto the rotating belt 25 as indicated in dotted lines. The belt 25 moves as indicated by the arrows and serves to feed the severed cord 15 towards the rolls 26 and 27. When the severed cord 15 is picked up by the rolls 26 and 27, the tampon 11 has by this time left the rolls 19 and 20 and is carried into the position shown in Figure 2 beneath the stop 21 and the notch 22. Further movement, however, of the tampon 11 will bring the tampon into the position in Figure 3 with the cord 14 attached to the tampon 10 entering the notch 22. Still further advance will bring the tampon 10 into the position of the tampon 11, shown in Figure 1, and the cord 14 will then be severed.

It will be noted that in Figures 2 and 3 the point of the severing member 24 is in contact with the cotton of the tampon 11. This contact does no harm since preferably the cords connecting the tampon are made from a suitable relatively low fusing point plastic thread. Such a material has a fusing point far below the combustion temperature or char temperature of the cotton or other equivalent material such as disintegrated cellulose from which the body of the tampon is made. Suitable fusible materials for this purpose are, for example, synthetic linear polyamides, i. e. nylon, cellulose acetate, cellulose acetate butyrates, ethyl cellulose, polyvinyl chloride, polyvinyl acetate, copolymers of polyvinyl chloride and polyvinyl acetate, vinylidene chloride and copolymers thereof with polyvinyl chloride or polyvinyl acetate and the like, and polyethylene. All of these materials have a fusing point and softening point below the char temperature of cellulose or cotton. Although all of these materials are in general less pervious to moisture and have a lesser capillary action than ordinary cotton which is conventionally used, it is desired to point out that of these materials certain of them are particularly non-hydroscopic and possess a greater resistance to the penetration of moisture or body fluids. These are, for example, the polyethylene, the vinylidene chloride and copolymers thereof, and the synthetic linear polyamides.

In Figure 4 there is shown a portion of a tampon indicated at 28 including a withdrawal cord 29 which is formed of a plurality of heat fusible filaments which have been severed in accordance with the present invention. As shown, these cords are fused together as at 30 so that they are also prevented from unravelling. This is especially desirable where the withdrawal string 29 is formed from a plurality of filaments as by a sewing or braiding operation. As shown in the drawing the tampon is of the type produced in accordance with the process of the aforementioned Winter and Rosenthal patent, #2,401,284. It has been found especially desirable in a tampon of the character which is composed of a plurality of braided string portions which serve to retain the cotton to provide some means to prevent the unravelling of the withdrawal cord.

Although the present process has been illustrated in the figures of the drawing as showing the tampon structure 11 in contact with the severing member 24 during a certain portion of its movement, it is within the broader scope of the present invention to space the severing member 24 so that it does not touch the body of the cotton 11. However, even in this instance, it is preferred to utilize a heating temperature that is capable of severing the cord 14 and/or fusing the same but is incapable or igniting or charring cotton or disintegrated cellulose since in the process of manufacture, small fragments of cotton adhere to the cords between the tampon structures proper. If the severing member 24, therefore, was heated to a high temperature, ignition of these stray cotton fibers would take place and result in a serious fire hazard.

It is also desired to point out that by providing a structure of the character described the precise point at which the tampon comes into contact with the severing member 24 is far less critical since the contact of the knife with the cotton will not result in any premature severance inasmuch as the knife is only capable of severing the plastic cord between the cotton wads or bunches.

It will be obvious to those skilled in the art that various changes may be made without departing from the spirit of the invention and therefore the invention is not limited to what is shown in the drawings and described in the specification but only as indicated in the appended claims.

I claim:

1. A process for severing of connected tampons of an absorbent cellulosic nature connected by a cord structure of a fusible plastic comprising passing a connected series of said tampons in proximity to a heated severing member, periodically tensioning said cord structure to bring the same into firm engagement with said severing member at a point immediately adjacent said tampons, and heating said severing member to a temperature sufficiently high to sever said cord but insufficient to affect tampons.

2. A process for the severing of connected tampons of a cellulosic nature connected by a cord structure of a fusible plastic comprising passing a connected series of said tampons in proximity to a heated severing member and retarding the movement temporarily of one of said tampons to tension the cord connecting said tampon and a preceding tampon to firmly engage said heated severing member.

3. A process for severing and fusing a cord structure composed of a plurality of filaments of a fusible plastic comprising passing said cord structure in proximity to a heated severing member, periodically tensioning said cord to bring the same into firm engagement with said severing member, and heating said severing member to a temperature sufficient to sever said cord structure and simultaneously fuse the filaments composing the same together.

4. A process for the severing of a connected series of braided tampons, each of said tampons being connected with each other tampon by a braided cord structure composed of a plurality of fusible filaments having a tendency to unravel upon severance, which comprises passing said cord structure and tampons in proximity to

a heated severing member, periodically tensioning said cord structure to bring a portion of said cord structure immediately adjacent a tampon into engagement with said heated severing member and heating said severing member to a temperature sufficient to sever said cord structure and simultaneously fuse the filaments of said braided cord structure together to prevent unraveling thereof upon severance.

HARRY C. A. BEHR.

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