

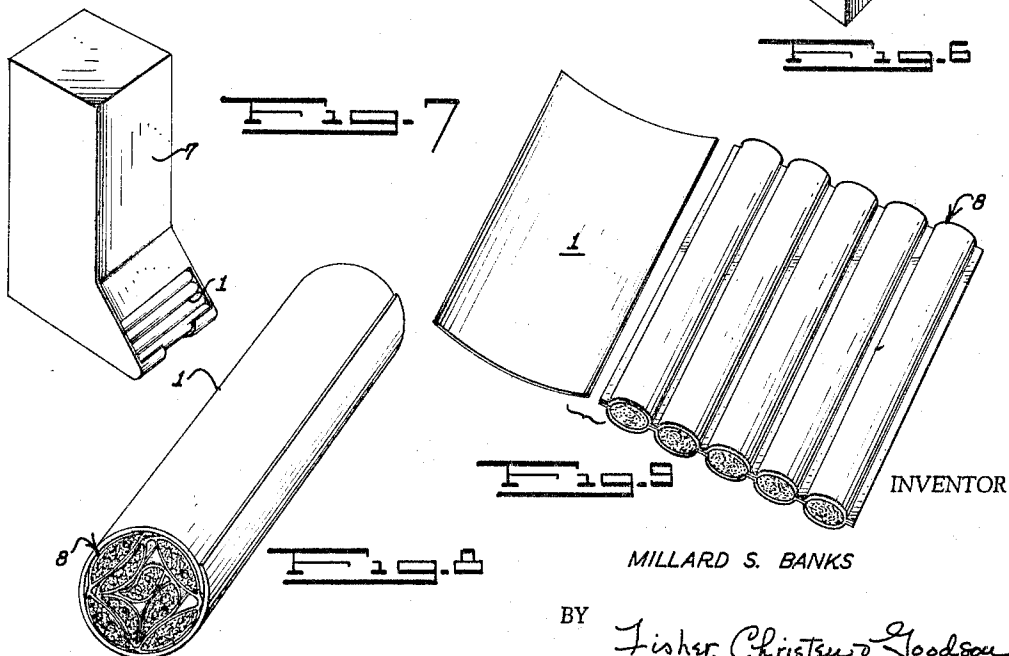
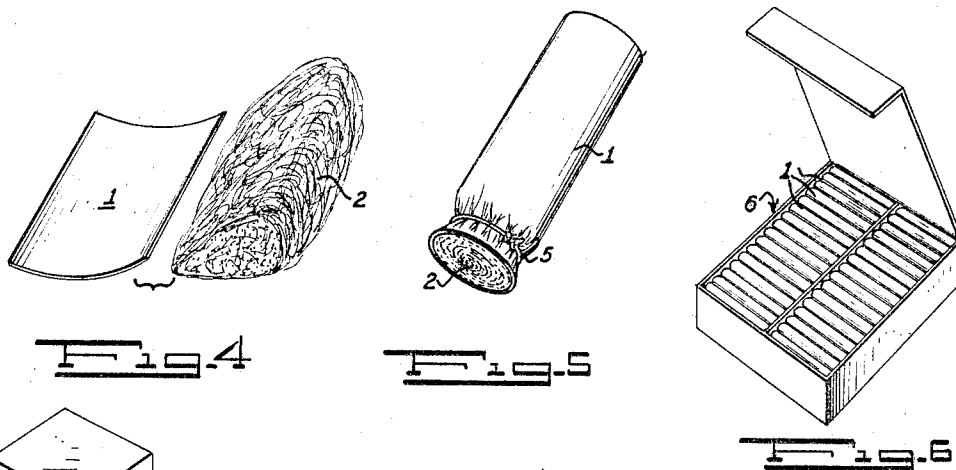
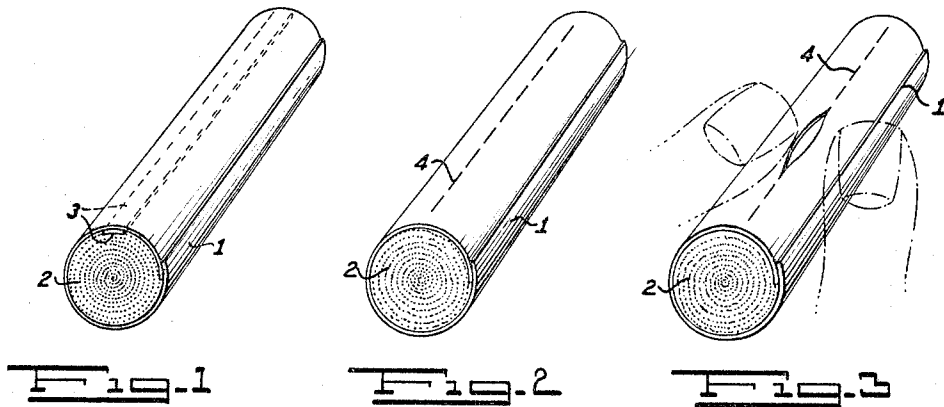
Oct. 11, 1966

M. S. BANKS
COMPACT ARTICLE

3,278,013

Filed Nov. 7, 1961

2 Sheets-Sheet 1



INVENTOR

MILLARD S. BANKS

BY

Fisher, Christen & Goodson
ATTORNEYS

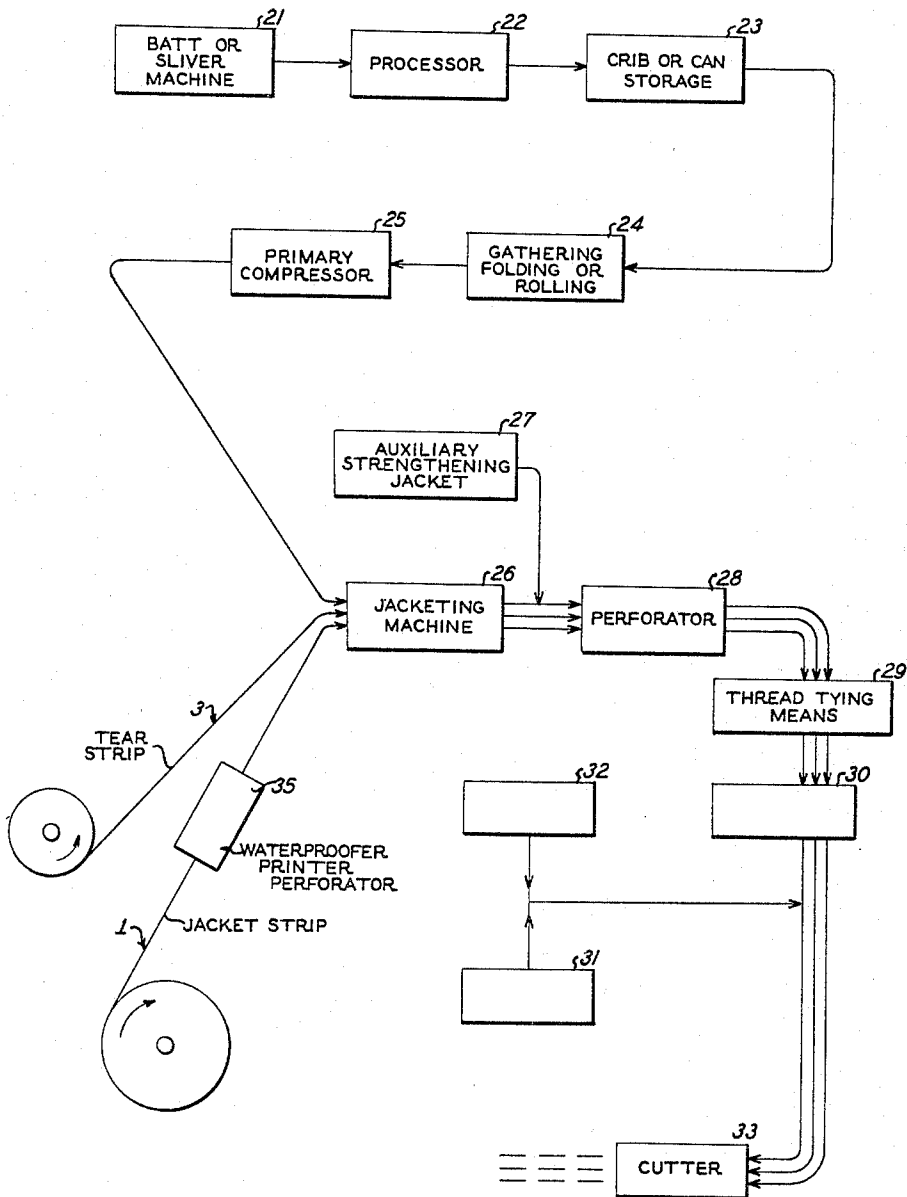
Oct. 11, 1966

M. S. BANKS
COMPACT ARTICLE

3,278,013

Filed Nov. 7, 1961

2 Sheets-Sheet 2



19.10

INVENTOR

MILLARD S. BANKS

BY *Fisher Christen & Goodson* ATTORNEYS

1

3,278,013 COMPACT ARTICLE

Millard S. Banks, 501 Lexington Ave., New York, N.Y.
Filed Nov. 7, 1961, Ser. No. 150,811
6 Claims. (Cl. 206—46)

This application is a continuation-in-part of my prior filed application Ser. No. 685,748, filed September 23, 1957, which is a continuation of my prior filed application Ser. No. 140,455, filed January 25, 1950, both abandoned.

This invention relates to prepared absorbent cotton, and particularly relates to unwoven, absorbent, cellulosic textile fibers, e.g., cotton, compressed by and contained in a tensioned, rupturable tubular jacket. The uses of absorbent cotton in the home, industry and in the medical and dental professions are well known. Illustratively, absorbent cotton is used for applying salves, medicaments, especially oily or fluid medicaments, as pledgets and generally as applicators and wiping materials.

It is a principal object of this invention to provide absorbent cotton in a compact form which is easy to employ in the above uses upon simple finger manipulation.

It is another object to provide unwoven absorbent cotton in a compact handy form wherein the advantageous physical properties of the cotton, e.g., absorbency, fluffiness, etc., are not depleted.

A further object is the provision of unwoven absorbent cotton in a form which permits the compact packaging of said cotton without depleting its advantageous physical properties.

Other objects and advantages will become apparent from the following description taken in conjunction with the accompanying drawings, wherein:

FIG. 1 is a perspective view showing one embodiment of the novel article of this invention wherein a tear-thread or tear-strip is provided;

FIG. 2 is a perspective view of another embodiment of the novel article of this invention wherein perforations are employed;

FIG. 3 is a perspective view of the novel article shown in FIG. 2 illustrating the finger manipulation employed to open said article;

FIG. 4 is a perspective view showing the novel article shown in FIGS. 2 and 3 in its opened condition;

FIG. 5 is a perspective view of another embodiment of this invention showing an article wherein means are provided for controlling the capillary absorbing power of said article;

FIG. 6 is a perspective view of a novel package containing the novel articles of this invention;

FIG. 7 is a perspective view of a refill dispenser for containing and dispensing the novel articles of this invention;

FIG. 8 is a perspective view of another embodiment of the novel article;

FIG. 9 is a perspective view of the novel article shown in FIG. 8 after it has been opened; and

FIG. 10 is a diagrammatic view of a system for manufacturing the novel articles of this invention.

In its broad embodiment, the novel article of this invention comprises an absorbent cotton mass which has been compressed into substantially cylindrical shape by a rupturable tubular casing surrounding said cotton and maintaining it in its state of compression, said casing being provided with rupturing means which extend substantially the entire length of said casing such that said casing can be readily ruptured by simple finger manipulation and thereby separated from the contained cotton mass to allow same to expand and assume substantially its original form.

A major advantage of the novel article is its compactness. Heretofore, two ounces of loose absorbent cotton

2

packaged for sale occupied a box approximately 5 inches long, approximately 3 inches high and approximately 3 inches wide. By means of the present invention, two ounces of cotton are packaged in a box which is approximately $4\frac{3}{4}$ inches long, $1\frac{1}{8}$ inches high and $2\frac{1}{8}$ inches wide. When the novel articles so packaged are opened, they provide loose, unwoven absorbent cotton having properties at least equally as good as the absorbent cotton packaged in the above-mentioned prior art package. In addition, the novel articles packaged as described above have the advantage of permitting the maintenance of individual portions of cotton in a sterile condition such that the use of one portion of cotton will not destroy the sterility of other portions. In this regard, each novel article can be sterilized and, if desired, packaged in a suitable wrapper to maintain its sterility.

Referring now to FIGS. 1 and 2, there are shown two embodiments of the novel articles. Each of these articles comprise a mass of coherent cotton fibers 2, which mass is compressed into a substantially cylindrical shape and held in its compressed substantially cylindrical shape by a rupturable tubular casing 1, e.g., paper, foil and the like. In the embodiment shown in FIG. 1, a tear-strip or tear-thread 3 is provided between the cotton mass 2 and the tubular casing 1 and extends the entire length of said tubular casing. One end of the tear-strip or tear-thread 3 projects from the tubular casing 1 and cotton mass 2 in order to provide a gripping surface. In opening the article of this embodiment, the tear-strip or tear-thread 3 is gripped at its projecting end and is pulled upwardly from the cotton mass 2. The outward urge due to the compressed state and the inherent resiliency of the cotton mass 2 assists the tear-strip or tear-thread 3 in rupturing the casing 1 and provides a firmness in combination with the casing 1 which permits the easy rupturing of said casing.

The casing 1 of the embodiment shown in FIG. 2 is provided with a line of perforations 4 extending from a point adjacent one end of said casing to a point adjacent the other end thereof. The outward urge of the compressed cotton mass 2 in combination with the restraining action of casing 1 provides a firm gripping surface which can be readily gripped by the thumbs of the operator to apply a spreading force on the perforations 4, as best shown in FIG. 3. The outward urge of the compressed cotton mass 2 also assists in tearing along the perforations 4 to facilitate the rupturing of the casing 1.

FIG. 4 illustrates the condition of the cotton mass 2 and casing 1 after said casing has been ruptured and said cotton mass has been released. This embodiment illustrates a web-form or pledget-form of the cotton mass 2 and thus represents a convenient form of the invention. The web-form or pledget-form presents a convenient form of cotton for such uses as wiping or applying salves or other medicaments. In forming this form of cotton mass 2 into an article, such as shown in FIGS. 1 and 2, a web of cotton is folded and compressed into a substantially cylindrical shape and the tubular casing 1 surrounds said cylindrical cotton mass. In this embodiment, when the tubular casing is ruptured, the cotton mass readily expands and unfolds to form the web or pledget shape, as shown in FIG. 4.

For some purposes the normal compression of the cotton within the casing provides higher absorbent power than is desired, and for some uses it is desirable to limit the absorbent power to a small portion of the structure. This is readily accomplished by the embodiment shown in FIG. 5, where a casing 1 is provided with the contained compressed, absorbent cotton. There is then provided a tightly tied string 5, spaced more or less closely from one end of the article. This string can be quite tightly drawn, thereby effecting a marked reduction in

the absorbent power of the fibers immediately under the tie-string, and sharply restricting the rate of travel of absorbed liquid into the main body of the structure. This embodiment is also particularly advantageous for such uses where it is desired to prevent wastage of material, such as salves, oily medicaments or fluid or semi-fluid substances, into the body of the article.

FIG. 6 illustrates a compact package for containing the novel articles of this invention for shipping, storing and/or selling them. There is shown a plurality of articles 1 contained in a small box 6 wherein the individual portions of cotton contained in the articles 1 are kept in clean, sterilized condition and permits usage of individual portions of cotton without destroying the clean, sterile condition of the other portions of cotton contained by the box.

FIG. 7 illustrates a refill dispenser 7 containing the novel articles 1 in a manner which provides a convenient holder for said articles while enabling the ready removal of said articles from the dispenser just prior to use.

FIGS. 8 and 9 illustrate another embodiment of the invention wherein a web 8 of unwoven, absorbent cotton is crimped and the crimped web is rolled up, folded, or gathered, and then compressed into a substantially cylindrical shape and wrapped in its rolled up, folded or gathered, compressed state, in a rupturable tubular casing 1, as hereinbefore described. The casing 1 is provided with a tear-strip or tear-thread 3 or with a line of perforations 4, as shown in and described with regard to FIGS. 1 and 2. When opened, this embodiment yields a fluffy sheet or web of unwoven, absorbent cotton which is particularly adapted for wiping purposes, as shown in FIG. 9.

The unwoven, absorbent cotton fibers employed in this invention are of the type ordinarily sold as absorbent cotton, although the particular grade of same is not especially critical. For example, washed and bleached mill waste containing very short length fibers can be employed or cotton linters can be used, if desired. Longer fiber cotton is also useable. In general, the cotton employed is unwoven and unspun so as to provide the desirable degree of absorbency. Also, unwoven, absorbent, synthetic, cellulosic textile fibers, e.g., rayon fibers, are used as substitutes for absorbent cotton and can be used in this invention in place of the unwoven, absorbent cotton fibers.

The casing 1 is preferably made of paper of sufficient strength to resist the outward urge of the cotton contained thereby. Examples of suitable papers include rice tissue or kraft paper, or any of the papers having properties between these two types. The amount of absorbent cotton contained within the casing 1 is not narrowly critical except that for best results it will generally be desired to contain as much cotton within said casing without substantially deteriorating the absorbency characteristics and fluffiness characteristics of the cotton to a degree which would eliminate its practical use as an absorbent wiping mass or applicator. In general, it is important that the cotton mass 2 be released from the casing 1 with substantially the same characteristics as it had before it was enclosed within said casing and so enclosed for long periods of time, such as on storage.

FIG. 10 diagrammatically illustrates a process by which the novel articles described herein can be economically and substantially automatically produced in mass quantities. In this process and the apparatus for practicing it, the fiber is first prepared in a batt or sliver machine 21, and it may then be passed through processing apparatus 22 such as a fluter or crimper if desired and for further processing of the cotton in any manner desired. These machines both are relatively slow working machines and they deliver the sliver at a much slower rate than the jacketing machine operates. Accordingly, the sliver, if not elongated or joined with other slivers and elongated to supply sufficient flow of material to the jacketing ma-

chine in an uninterrupted, continuous slack feed operation, is conveniently stored in a crib or can 23. Several sliver machines may be operated simultaneously, or for a longer period of time than the jacketing machine, each delivering its output to a crib. The sliver or rope from the successive cribs is then, if desired, delivered through a gathering, folding or rolling roller member 24, and then to a primary compressor 25. These may both be devices utilizing compressor rolls, and controlled humidity and heat may also be used for ease of compression. From the main compressor, the fiber is conveyed to the jacketing machine. This may consist of a funnel into which the fiber is introduced in pregathered, processed, strip form, along with the jacket strip 1 already previously waterproofed, printed and perforated, if desired, at 35. It may take the form simply of a funnel type device or it may be a combination of funnel and auxiliary compressor rolls which may also include wrapping rolls, pasting rolls, jacket crimping or lacing rolls, closing rolls, and the like, according to the characteristics of the particular fiber being utilized, and the characteristics of the jacket material and the use to which the finished article is to be put. The tear-strip 3 may also be included at this time. This member of the structure is shown at 26 in the drawing. From the member 26, a long cylinder of compressed fiber and tensioned jacket may be conveyed to a device for applying an auxiliary strengthening jacket if such is desired, as indicated by the member 27; or a strengthening jacket may be applied as a later, supplemental operation. Auxiliary printing, recompression and shaping devices may be included as well as a perforator, shown as member 28, and appropriate thread tying means 29 may also be positioned at this point or applied later as a supplemental operation.

The last unit in the machine is a cutter 33, set to cut the long cylinder into appropriate lengths, and if not already perforated, also a perforator to cut and perforate simultaneously. These lengths may then be stacked in appropriate trays and conveyed to a suitable packaging machine.

What is claimed is:

1. A new article of manufacture comprising an unwoven, absorbent cotton in a compressed state and a rupturable tubular casing surrounding said material and maintaining it in its state of compression, said cotton being composed of a mass of coherent cotton fibers compressed from end to end into a substantially cylindrical shape to reduce its volume considerably from that of its uncompressed state, said cotton in its compressed form having an inherent resiliency tending to expand so as to resume its original uncompressed state, said tubular casing being provided with rupture means along a line extending from one end of said casing to the other end thereof so that said casing can be readily ruptured to release said compressed cotton, the tendency of said compressed cotton to expand acting to assist in rupturing said casing, said cotton being retained in a substantially smaller space than its original volume and regaining substantially its original form upon rupture of said casing and release of said cotton from said casing.

2. The article defined in claim 1, wherein said rupture means is in the form of a line of longitudinal perforations to weaken said casing so that the expansion force exerted by said cotton acts to assist in rupturing said casing.

3. A new article of manufacture comprising an unwoven, absorbent cotton in a compressed state and a rupturable tubular casing surrounding said material and maintaining it in its state of compression, said cotton composed of at least one web of coherent cotton fibers folded and compressed from end to end into a substantially cylindrical shape to produce its volume considerably from that of its uncompressed state, said cotton in its folded, compressed form having an inherent resiliency tending to expand and unfold so as to resume its original uncompressed state, said tubular casing being open at its ends

5

and being provided with rupture means extending along a line from one end of said casing to the other end thereof so that said casing can be readily ruptured to release said folded, compressed cotton, the tendency of said compressed cotton to expand acting to assist in rupturing said casing, said cotton being retained in a smaller space than its original volume and regaining substantially its original form upon rupture of said casing and release of said cotton from said casing.

4. The article as claimed in claim 3 wherein said cotton is natural cotton.

5. The article defined in claim 1 wherein said rupture means begins at one end of said casing and ends at the other end thereof.

6. An absorbent structure consisting of a tubular restraining member of cellulosic sheet material, and within said tubular restraining member, a filler member of absorbent cellulosic fibers condensed by extraneous pressure to such a degree as to cause the minor inherent springiness of the individual fibers to exert an outward pressure against the inner surface of said tubular restraining member within a range between approximately 2 and 20 pounds per square inch, whereby said tubular restraining member is tensioned by an amount between 16% and 80% of its tensile strength, the springiness of the pressure-condensed fibers being also sufficient to stress said tubular restraining member to such a degree as to impart, to the combined structure of said tubular restraining member and enclosed condensed fibers, a stiffness many times

6

greater than the sum of the normal separate stiffnesses of said tubular restraining member and condensed fibers, the construction of the condensed fibers being such that upon removal of said tubular restraining member, the condensed fiber structure expands to form a fibrous body having a volume from approximately 2 to 25 times the volume of the tubular restraining member, and a fluffiness substantially the same as before the compressing operation, said tubular restraining member being provided around a portion thereof with a constricting member so as to cause additional compression upon the fibers whereby the rate of absorption of liquid between the parts of the structure separated by said constricting member is substantially reduced.

References Cited by the Examiner

UNITED STATES PATENTS

1,811,749	6/1931	Fromert	15—209
2,057,122	10/1936	Trevellyan	206—46
2,132,958	10/1938	Martin	206—46
2,263,835	11/1941	Atkinson	229—51
2,299,027	10/1942	Novak	206—44.12
2,769,533	11/1956	Booth	206—56

JOSEPH R. LECLAIR, *Primary Examiner*.

EARLE J. DRUMMOND, FRANKLIN T. GARRETT,
Examiners.

R. PESHOCK, *Assistant Examiner*.

UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,278,013

October 11, 1966

Millard S. Banks

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 4, line 71, for "produce" read -- reduce --.

Signed and sealed this 5th day of September 1967.

(SEAL)

Attest:

ERNEST W. SWIDER

Attesting Officer

EDWARD J. BRENNER

Commissioner of Patents