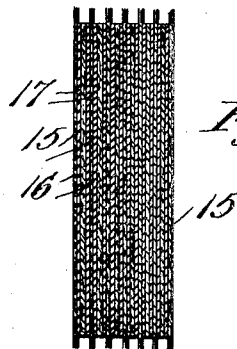
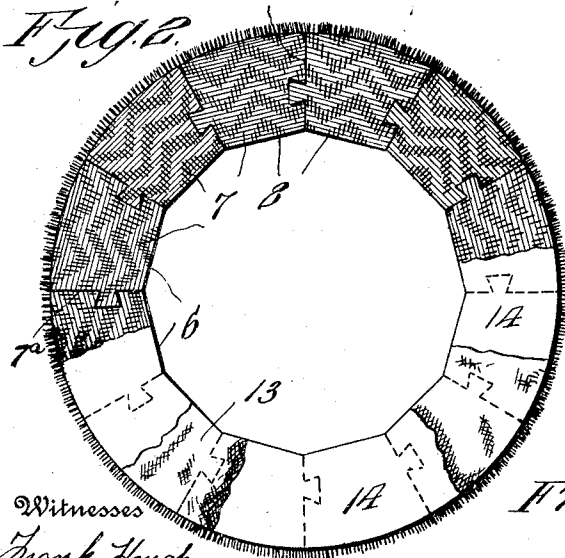
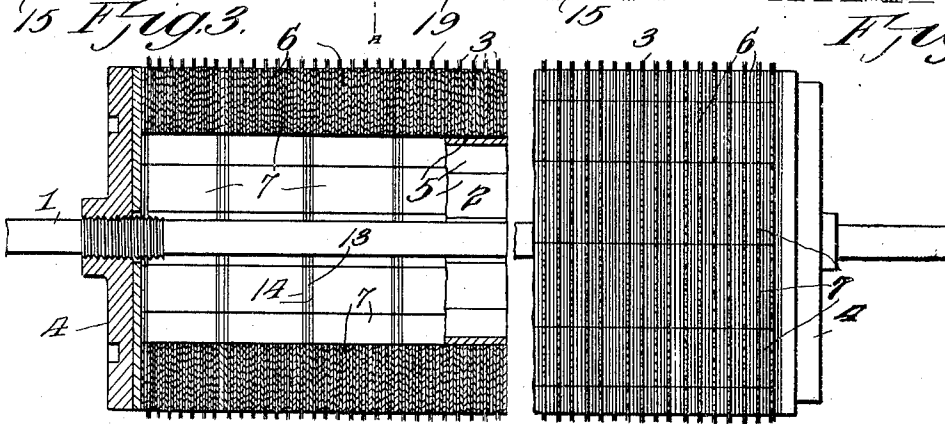
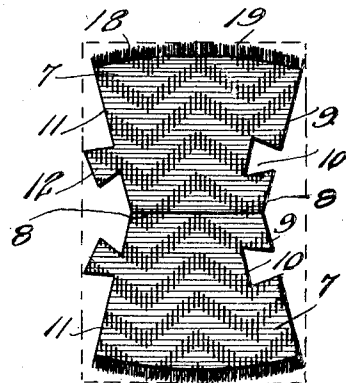
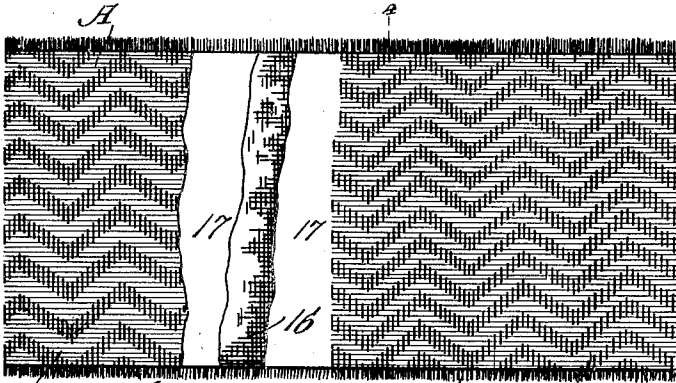


F. A. DIFFENDERFER.
 ROLLER FOR COTTON GINS.
 APPLICATION FILED AUG. 27, 1910.

1,016,817.

Patented Feb. 6, 1912.



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ROLLER FOR COTTON-GINS.

1,016,817.

Specification of Letters Patent.

Patented Feb. 6, 1912.

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To all whom it may concern:

Be it known that I, FRANCIS A. DIFFENDERFER, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented new and useful Improvements in Rollers for Cotton-Gins, of which the following is a specification.

This invention relates to a novel construction of roller for cotton gins and analogous machines, and a novel process of manufacturing the same and parts thereof.

The object of the invention is to provide a cotton gin roller having a fiber-grasping surface which will rapidly and efficiently seize and separate the cotton fiber from the seeds or burs without liability of said surface being choked or damaged or of the same injuring or skipping portions of the fiber, and which presents at all points around the periphery of the roller a uniform grasping surface made up of closely arranged, fiber-engaging projections radial at all points to the axis of the roller, whereby a maximum amount of cotton may be ginned within a minimum period of time.

A further object of the invention is to provide a process of making the roller and parts thereof whereby a uniformly effective fiber-grasping surface of the character described may be produced and economy of manufacture of the roller and its component parts secured.

The invention consists of the novel features of construction, combination and arrangement of parts, hereinafter fully described and claimed, reference being had to the accompanying drawing, in which:—

Figure 1 is a longitudinal section of the left-hand portion of a ginning roller embodying my invention, the core being partially broken away. Fig. 1^a is a side elevational view of the corresponding right-hand portion of the roller illustrated in Fig. 1. Fig. 2 is a sectional side elevation of one of the rings or annuli of which the body or fiber-grasping surface of the roller is formed. Fig. 3 is a plan view, with portions broken away, of the primary strip from which the ring-forming segments are made. Fig. 4 is a transverse section on the line 4—4 of Fig. 3. Fig. 5 is a plan view of two of the segments formed from the strips shown in Fig. 3, illustrating in dotted

outline the shape of the portion of the strip from which they were made.

Referring to the drawing, 1 designates the shaft or axle, 2 the core, and 3 the body portion or fiber-grasping surface of a ginning roller embodying my invention, which body portion is held in position upon the core by clamping members 4, which may be of any preferred construction. The periphery of the core is provided, as usual, with angular faces 5, and is shown in the present instance as having twelve equal facial angles, although any suitable form of core may be employed.

The body or fabric-engaging portion 3 of the roller is principally made up of a longitudinal series of rings or annuli 6, each consisting of a series of segmental blocks or sections 7 having their side edges in abutting contact, said blocks or sections being equal in number to and arranged to bear at their basal edges 8 against the angular faces 5 of the core, whereby a firm seating of the blocks upon the core is secured and the body portion held from shifting circumferentially on the core.

Each segmental block or section 7 is provided in one of its side edges 9 with a dove-tailed notch or recess 10 and upon its opposite side edge 11 with a dove-tailed tongue or projection 12, the tongues and notches of the respective abutting edges of the series of blocks being engaged with each other for an interlocking connection between the blocks to assist in holding them firmly assembled. Preferably the abutting edges of the blocks are additionally united by interposing strips of gum tissue as at 7^a between the same and vulcanizing the whole together under pressure, or may be mechanically or chemically united in any preferred way.

The rings or annuli so formed and arranged to produce the fiber-grasping surface are separated and united by binders disposed between the meeting faces of the respective rings, each binder consisting of a ring or annulus 13 of a suitable fabric, such as canvas, secured to the faces of the adjacent rings by similarly shaped layers 14 of gum tissue or the like, through which, under heat and pressure, all the rings or annuli are vulcanized together, producing a solid laminated fabric-engaging surface having great strength and durability. The outer

faces of the end rings of the series are also preferably provided with protecting binders or layers of fabric secured thereto in the same manner, to adapt them to effectually sustain wear and tear and the pressure of the clamping members 4. In the formation of the body or fabric-engaging surface, the rings are disposed in superposed relation within a suitable mold with the interposed layers of canvas and gum tissue and, while subjected to pressure, are heated or baked in an oven to fuse the gum tissue and thereby vulcanize the meeting faces of the rings together.

The blocks 7 are formed in a novel manner from an oblong rectangular or long, narrow composite or laminated strip of material "A" of the construction shown in Figs. 3 and 4. This strip consists of alternately arranged layers 15 and 16 of hair cloth, or its equivalent, and canvas, the meeting faces of such layers being united under fusion and pressure by an interposed layer or sheet of gum tissue 17, the arrangement being such that the outer layers of hair cloth are disposed at the opposite sides of the block. In the manufacture of the blocks the use of hair cloth is preferred but any other equivalent fabric having wefts of filaments which may serve as fabric-engaging elements, and warps of cotton, wool or other suitable material for holding the filaments assembled, may be employed, and such as contemplated in the use of the term "hair-cloth" wherever used in the appended claims. The ends of the filaments project beyond the outer edge 18 of the block to produce the fabric-engaging projections 19, such edge 18 and the projections 19 being cut on the proper arc of curvature so as to produce a body portion of true circular form for coöperation with the doctor-blade of the gin to effectually separate the cotton fiber from the seeds and burs and other refuse matter. It will thus be seen that the entire body portion or engaging surface of the roller is formed of a composite mass of hair-cloth and fabric firmly bound by vulcanization, and that the entire periphery of the body portion so produced presents a surface composed of the projections 19 which are closely arranged to seize and hold the fibers and separate the same from the seeds or burs. These projections, while stiff enough to draw the fiber from the refuse material, are permitted by the rubber incorporated into the body of the roller to have a sufficient yielding action to prevent injury thereto under strain, as well as to prevent the cotton from being torn or otherwise injured during the delinting action, whereby any possibility of the teeth or projections being clogged in service will also be obviated.

The strip "A" may be of any desired length, but is preferably of restricted width

and is so formed that the wefts or filaments of horse-hair or analogous material extend in the direction of their length transversely thereof and project at their ends beyond the longitudinal edges of said strip. The width of the strip preferably corresponds to or but slightly exceeds the combined length of a pair of blocks when placed end-to-end in abutting contact, as shown in Fig. 5. From this strip the blocks are cut or stamped out through the action of suitable dies, which is preferably of a character to cut or stamp out a pair of blocks at each operation. Each pair of blocks is cut out from a substantially oblong rectangular portion of the strip, as indicated by the dotted lines in Fig. 5, and in the stamping operation the end of the strip is inserted between the dies and the blocks are cut out and severed from connection by the action of the dies along a line between their inner edges 8, in the plane of the central longitudinal line of the strip "A" midway between the longitudinal side edges of said strip, from which edges the outer curved or arcuate ends or edges 18 of the blocks are cut by a correspondingly shaped portion of the die. From this it will be understood that sections of the strip A are cut out along the length of said strip, each section providing a pair of the blocks, which are arranged in apposition, the blocks being exact duplicates in form and construction and having their curved edges cut on the proper arc by the action of the dies. After the blocks have been thus cut out a sufficient number of the fabric or warp threads may be pulled out to project the wefts or hair fibers to the desired extent beyond the curved edges of the bodies of the blocks. Any of the remaining warp threads which may be unavoidably loosened in this operation will be firmly held when the formed ring sections of the roller are vulcanized together.

A strip "A" of the character and form set forth is employed and the blocks formed in the manner described in order to have the hairs or wefts of each block extend longitudinally between the inner and outer faces thereof and radially with relation to the axis of the roller.

It will be understood that as the wefts of the hair-cloth run solely in one direction and at right angles to the warps, the blocks must necessarily be of a restricted size and their outer edges cut on an arc of a restricted radius in order to secure the described radial arrangement of the wefts and to enable the blocks to be made in an economical manner. By forming the blocks in the described way out of a strip of material of the character set forth a radial arrangement of the wefts is obtained and the blocks made without waste of material. Hence, when the blocks are assembled to produce

the fabric-grasping surface in the manner hereinbefore set forth, the fabric-engaging teeth or projections formed by the outer ends of the hair filaments or wefts will extend radially to the axis of the cylinder at all points around its circumference, whereby such teeth or projections will be properly disposed throughout the entire area of the fabric-grasping surface to uniformly engage and grasp the fiber. By this means skipping of portions of the fiber in the ginning operation will be avoided, so that a maximum amount of cotton may be ginned within a minimum period of time.

It will be understood that in the formation of the strip "A" the layers of canvas and gum tissue will be of less width than the width of the hair-cloth, while the layers of canvas and gum tissue employed in binding the composite rings in the production of the body of the roll will similarly be of less diameter than the hair-cloth layers, in order to provide for the projection of the ends of the filaments or wefts at the marginal edges of the hair-cloth to form the fabric-engaging teeth and to permit them to have the desired amount of flexibility above described. The use of gum tissue as the vulcanizing agent is preferred over sheet rubber or cementitious material as it allows a certain amount of elasticity of the body and at the same time more thoroughly penetrates the layers of fabric to more firmly and solidly bind the same together. By the construction set forth a fabric-engaging surface of great strength and durability is produced in addition to the advantages hereinbefore mentioned.

Having thus described my invention, what I claim, is:—

1. A cotton delinting roller having a fiber-grasping surface composed of a plurality of rings, each formed of a series of laminated segments of hair-cloth and fabric, the hair-cloth having the hair-fibers projecting therefrom and forming the fiber-grasping face of the roller.

2. A cotton delinting roller having a fiber-grasping surface formed of a plurality of vulcanized ring sections composed of segments formed of vulcanized layers of hair-cloth and fabric, the layers of hair-cloth having their hair-fibers arranged radially to the axis of the roller and projecting to form a fiber-grasping face around the periphery of the roller.

3. A cotton delinting roller having a fiber-grasping surface formed of rings arranged side by side and having their meeting faces bound together, each ring comprising a series of segments formed of alternately disposed layers of hair-cloth and fabric, bound together, the layers of hair-cloth having their hair-fibers arranged radially to the axis of the roller and projecting to form

a fiber-grasping face around the periphery of the roller.

4. A cotton delinting roller having a fiber-grasping surface composed of a series of rings arranged side-by-side and suitably united, each ring consisting of a series of segmental blocks composed of alternately disposed layers of hair-cloth and fabric, vulcanized together, the layers of hair-cloth having their hair-fibers projecting to form a fiber-grasping face around the periphery of the roller.

5. A cotton delinting roller having a fiber-grasping surface composed of a series of rings arranged side-by-side and suitably united, each ring consisting of a series of interlocked segments formed of vulcanized layers of hair-cloth and fabric, the hair-fibers of the cloth layers extending radially to the axis of the roller and projecting therefrom to form a fiber-grasping face around the periphery of the roller.

6. A cotton delinting roller having a fiber-grasping surface composed of a series of rings, each consisting of segments formed of alternate layers of hair-cloth and fabric vulcanized together, and layers of binding fabric arranged between and vulcanized to the meeting faces of the rings, the layers of hair-cloth having their hair-fibers projecting to form a fiber-grasping face around the periphery of the roller.

7. A cotton delinting roller having a fiber-grasping surface composed of a series of rings, each ring consisting of segments formed of alternate layers of hair-cloth and fabric vulcanized together, said segments having an interlocking engagement, the meeting faces of the rings being vulcanized to interposed fabric binders, and the layers of hair-cloth having their hair-fibers projecting to form a fiber-grasping face around the periphery of the roller.

8. A cotton delinting roller having a fiber-grasping surface made up of a series of rings having their meeting faces vulcanized together, each ring consisting of a series of connected segments formed of vulcanized fabric and hair-cloth laminae, the hair-fibers of the cloth extending radially to the axis of the roller and projecting beyond said layers to form a fabric-engaging face around the periphery of the roller.

9. A cotton delinting roller having a fiber-grasping surface composed of a series of rings arranged side by side and vulcanized together, each ring consisting of segments composed of vulcanized laminae of hair-cloth and fabric, the hair-fibers of the former being arranged radially to the axis of the roller and projecting to form the fiber-engaging surface.

10. A cotton delinting roller having a fiber-grasping surface composed of a series of rings, binding strips vulcanized to the

meeting faces of the rings, each ring comprising a series of segments formed of alternate layers of hair-cloth and fabric vulcanized together, the hair-fibers of hair-cloth
5 layers of the segments of the rings extending radially to the axis of the roller and projecting beyond the layers to form a fiber-engaging face around the periphery of the roller.

10 11. A cotton delinting roller having a fiber-grasping surface composed of a series of suitably assembled and united rings, each consisting of a series of segmental blocks having arcuately curved outer edges and
15 formed of laminæ of hair-cloth and fabric, the wefts of the hair-cloth of each block extending radially to the center of the circle on which its curved outer edge is struck, and the wefts of the hair-cloth of the assembled rings projecting therefrom to form
20 the fiber-grasping face of the roller.

12. A cotton delinting roller having a fiber-grasping surface composed of a series of rings, arranged side-by-side and suitably
25 united, each ring being formed of laminæ of hair-cloth and fabric vulcanized together and made up of a series of radially divided sections having arcuate outer edges concentric with the axis of the ring and forming
30 the periphery of the ring, the wefts of the hair-cloth of each ring section extending radially to the axis of the ring and the wefts of the hair-cloth of the assembled rings projecting therefrom to form the
35 fiber-grasping face of the roller.

13. A cotton delinting roller having a

fiber-grasping surface made up of a series of rings arranged side-by-side and vulcanized together, each ring consisting of vulcanized laminæ of hair-cloth and fabric and
40 being formed of sections each having the wefts or hair-fibers of the hair-cloth thereof extending radially to the axis of the ring, the hair-fibers of the assembled rings projecting therefrom to form the fiber-grasping
45 surface of the roller.

14. In a cotton delinting roller, an element for forming a fiber-grasping surface consisting of a block formed of vulcanized laminæ of hair-cloth and fabric, said block
50 having an arcuately curved outer edge and being of a form adapted for assemblage with similar blocks into a ring, the wefts of the hair-cloth layer or layers of said block extending radially to the center of the circle
55 on which the arcuate edge of the block is struck and projecting beyond such edge.

15. In a cotton delinting roller, an element for forming a fiber-grasping surface consisting of a segmental block having an
60 arcuately curved outer edge and formed of alternate layers of vulcanized fabric and hair-cloth, the wefts of the hair-cloth extending radially to the center of the circle on which the arcuate edge of the block is
65 struck and projecting beyond such edge.

In testimony whereof I affix my signature in presence of two witnesses.

FRANCIS A. DIFFENDERFER.

Witnesses:

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BENNETT S. JONES.