No. 729,285. PATENTED MAY 26, 1903.

J. J. DAVENPORT.

MACHINE FOR BALING FIBER.

APPLICATION FILED APR. 23, 1902.

NO MODEL. 3 SHEETS—SHEET 1.

Fig. 1.

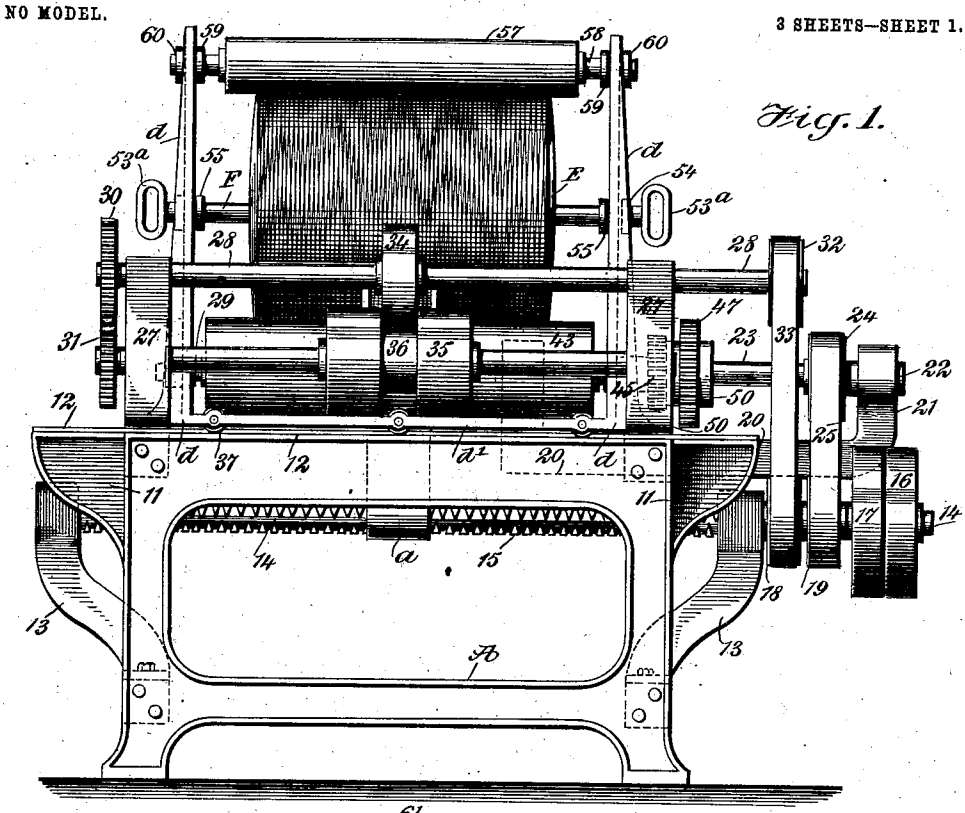
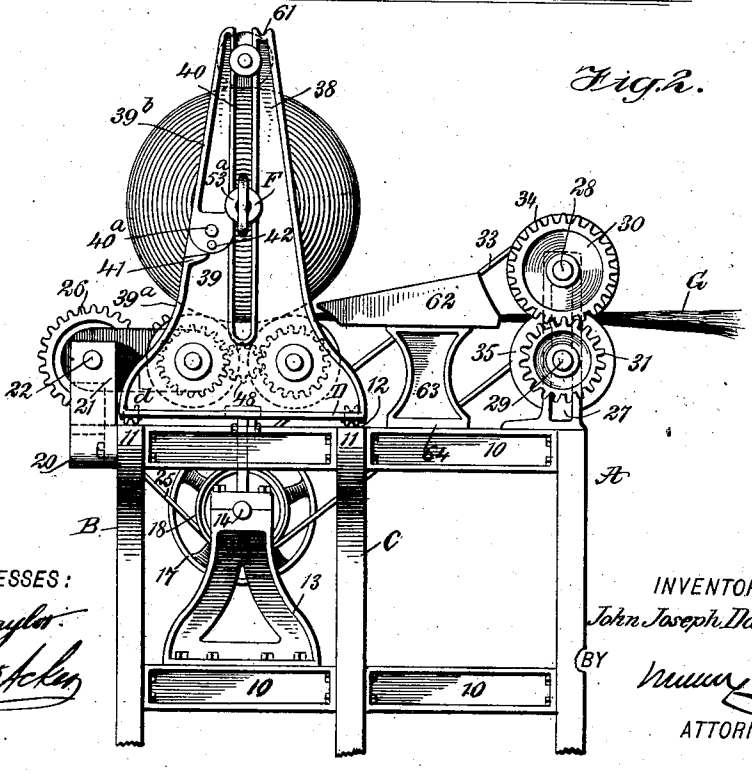


Fig. 2.



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NO MODEL. 3 SHEETS—SHEET 2.

Fig. 3.

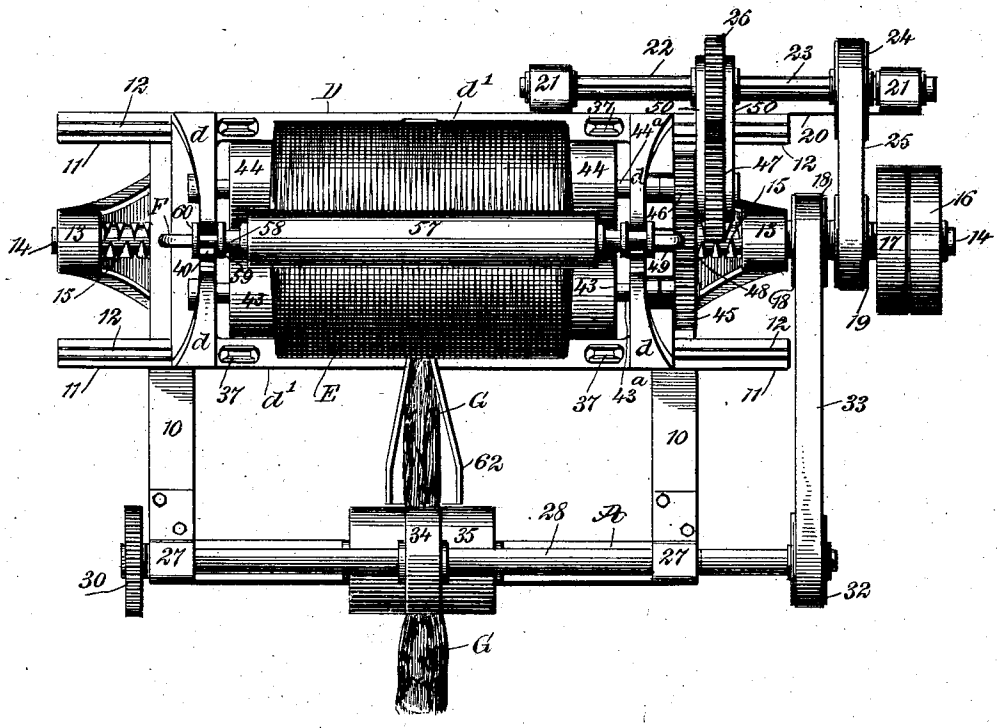
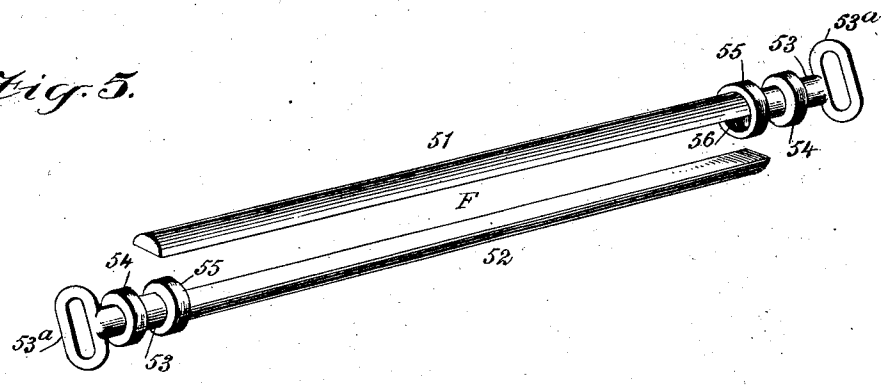


Fig. 5.



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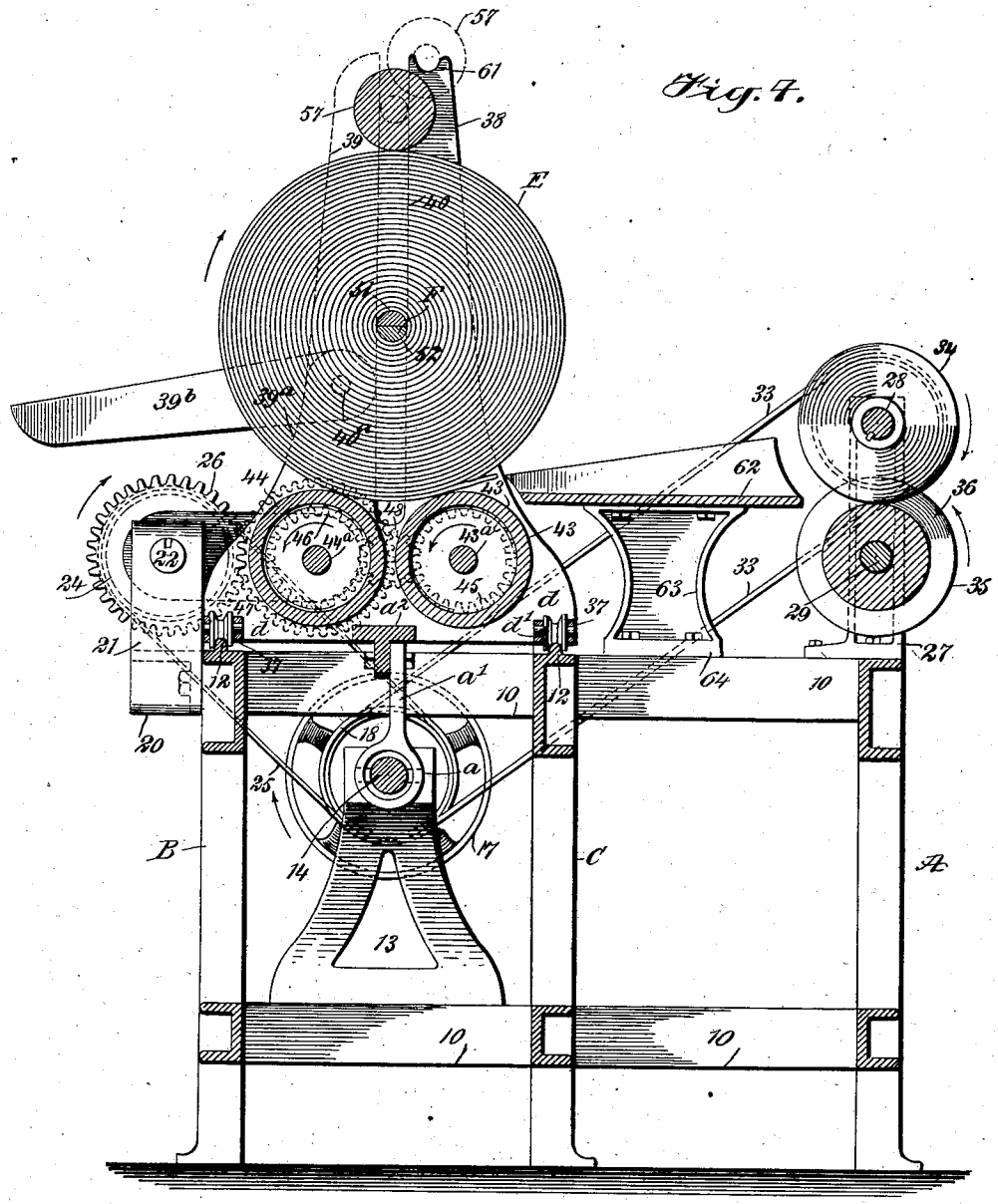
NO MODEL. 3 SHEETS—SHEET 3.

Fig. 4.



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No. 729,285. Patented May 26, 1903.

UNITED STATES PATENT OFFICE.

JOHN JOSEPH DAVENPORT, OF BROOKLYN, NEW YORK, ASSIGNOR OF ONE-HALF TO ABRAHAM GOULD JENNINGS, OF BROOKLYN, NEW YORK.

MACHINE FOR BALING FIBER.

SPECIFICATION forming part of Letters Patent No. 729,285, dated May 26, 1903.

Application filed April 23, 1902. Serial No. 104,278. (No model.)

To all whom it may concern:

Be it known that I, JOHN JOSEPH DAVENPORT, a citizen of the United States, and a resident of the city of New York, borough of Brooklyn, in the county of Kings and State of New York, have invented a new and Improved Machine for Baling Fiber, of which the following is a full, clear, and exact description.

My invention relates to machines for baling fiber—that is, for winding the fiber with a traverse action into compact bales.

The purpose of the invention is to provide a simple and compact machine constructed to wind hemp and similar fiber in open slivers and not in a twisted condition, as heretofore, so that the fiber when carried to a hackling-machine will be presented in a straight and comparatively untangled condition and need not be untwisted at such time, as is customary, thereby preventing the fiber from being broken and preserving all of the life of the fiber when made up for commercial purposes.

Another purpose of the invention is to provide a winding mechanism which will not pull apart the slivers of fiber while the fiber is being wound in a bale, and also to provide means whereby the bale will have an exceedingly small core and will be very compact, enabling the greatest amount of material to be packed without injury in the smallest possible space.

Another purpose of the invention is to provide a bale-stick which can be conveniently drawn from the core of the bale and to so construct the guides for the bale and stick that sections of the guides may be quickly and conveniently placed in position to produce a platform or track upon which the completed bale can be rolled from the machine to a conveyance or to a point beyond the machine without injury thereto and with little effort on the part of the operator.

The invention consists in the novel construction and combination of the several parts, as will be hereinafter fully set forth, and pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a front elevation of the machine. Fig. 2 is an end view of the same. Fig. 3 is a plan view of the machine. Fig. 4 is a central transverse section through the machine, and Fig. 5 is a detail perspective view of the core stick or support upon which the bale is made.

The frame of the machine may be of any desired shape or construction. As shown, it consists of front, rear, and intermediate rectangular sections A, B, and C of equal height, connected at the top and bottom portions of their ends by cross-bars 10, as is shown in Figs. 2 and 4. At the upper end portions of the rear and intermediate frame-sections B and C horizontal extensions 11 are provided, the upper surfaces of which extensions are flush with the corresponding surfaces of said sections, as is illustrated in Figs. 1 and 2. In the further construction of the frame tracks 12 are secured upon or are made integral with the upper surfaces of the frame-sections B and C and their extensions, upon which tracks a carriage D, to be hereinafter described, is adapted to travel.

Outwardly and upwardly extending brackets 13 are secured to the frame of the machine at the bottom cross-bars 10 between the frame-sections B and C, and each bracket carries a suitable box or bearing at its upper end. A traverse shaft 14 is journaled in the boxes of the brackets 13, projecting beyond the right-hand bracket, and crossed right and left hand threads 15 are produced upon the said shaft between its bearings, as is shown in Figs. 1 and 3. The traverse shaft 14 carries at its extended end a fast driving-pulley 16 and an associate loose pulley 17 and fast pulleys 18 and 19 for the transmission of power to other shafts, to be hereinafter mentioned.

At the right-hand rear portion of the main frame a bracket-bar 20 is secured, which extends beyond the right-hand end of the frame, as is shown in Figs. 1 and 3, which bracket-bar is provided at each end with an upright member 21, having suitable boxes, in which boxes are journaled the ends of a line-shaft 22, and on this shaft a longitudinal feather 23 is formed. (Shown in Fig. 3.) The shaft 22 is driven through an attached pulley 24

and a belt 25, running over the pulley 24 and the pulley 19 on the traverse shaft 14. This line-shaft 22 carries at its feathered portion a gear 26, which slides on the shaft and turns thereon for use in connection with the carriage D.

Standards 27 are secured upon the bed of the frame at its front end portions, and two parallel feed-shafts 28 and 29 are journaled in said standards, one below the other, as is shown in Figs. 1, 2, and 4. Both shafts 28 and 29 extend beyond the left-hand side of the frame, and meshing gears 30 and 31 are secured at said ends of the shaft, while the upper feed-shaft 28, which is the driver, is carried beyond the right-hand side of the frame, and at the extended end of the shaft 28 a pulley 32 is secured, connected by a belt 33 with the driving-pulley 18 on the traverse shaft 14.

At the central portion of the upper feed-shaft 28 a feed-roller 34 is secured, and at the corresponding portion of the lower feed-shaft 29 a longer roller 35 is attached to said shaft. The longer roller 35 is provided with a peripheral recess 36 of such dimensions as to receive between its side walls the side surfaces of the upper feed-roller 34, as is best shown in Fig. 1. The periphery of the upper roller 34 is practically in contact with the peripheral wall of the recess 36 in said lower roller 35, as is also shown in Fig. 1. The material to be fed to the carriage D is received in the recess 36 and is pressed and guided to the carriage by the coaction of the two rollers 34 and 35.

The frame of the carriage D consists of upright end sections d and front and rear bars d', connecting the base portions of the uprights, which front and rear bars d' are provided with openings at intervals, in which openings rollers 37 are mounted to turn, and said rollers 37 are adapted to travel upon the tracks 12. Each end section d of the carriage D is in two members 38 and 39 from a point near the base to the top, the members being separated by a vertical slot 40, as is shown in Figs. 2 and 4. The upright members 39 of the carriage D are in two sections—a fixed lower section 39^a and an upper adjustable section 39^b—as is especially shown in Fig. 2. These two sections 39^a and 39^b are pivotally connected, as is shown at 40^a in Figs. 2 and 4, and the lower ends of the upper sections 39^b are preferably rounded off, and in the outer side surfaces of the lower sections 39^a of the said sections 39 of the carriage a forwardly-directed and upwardly-inclined rest or stop projection 41 is formed, which when the upper sections 39^b are dropped, as is shown in Fig. 4, receive and support the said upper adjustable sections 39^b of the carriage in a downwardly and rearwardly inclined position, as is shown in Fig. 4. The drop-sections 39^b of the carriage then constitute tracks upon which the completed bale is rolled to skids or other devices connected with the said drop-sections 39^b to convey the bale with little effort from the machine to any vehicle or support designed to receive it.

As the bale while being made is supported at the slotted portions of the side uprights d of the carriage when the sections 39^b are dropped, the bale is free to leave its supports, as at that time the core of the bale will be above the break in the members 39 of said uprights. The drop-sections 39^b of the uprights of the carriage may be held in an upright position and permitted to drop by any suitable or well-known devices—as, for example, spring-controlled pins 42 may be carried by the drop-sections and arranged when said sections are vertical to enter openings in the fixed and mating sections 39^a of said members.

The carriage is given movement from end to end of the main frame through the medium of a nut a, correspondingly threaded to the threaded portion 15 of the traverse shaft 14, which threaded portion of said shaft the nut is adapted to receive, and this nut may be secured to the carriage in any suitable manner. As shown in Fig. 4, the nut is provided with an upwardly-extending stem or shank a', secured to the central portion of a central connecting-bar a^2, extending from one side upright d to the other at their lower ends.

While the bale E is in process of formation, rotary motion is imparted to it as the carriage D travels from end to end of the main frame and past the feed-rollers 34 and 35 through the medium of two lower driven rollers 43 and 44, the shafts 43^a and 44^a whereof are journaled in the base-sections of the uprights d of the carriage D. These shafts extend out beyond the right-hand upright d, the rear shaft 44^a farther than the forward shaft 43^a, as is shown in Fig. 3. The forward shaft 43^a, at its right-hand end, is provided with a gear 45, meshing with a pinion 48 on a stud-axle 49, and said pinion meshes with a gear 46 on the corresponding end of the rear shaft 44^a. At the same end of the rear shaft 44^a a second gear 47 is secured, meshing with the gear 26 on the line-shaft 22, as is shown in Figs. 2 and 3. By this system of gearing or through a similar system the friction feed-rollers 43 and 44 are made to turn in the same direction—that is, in direction of the rear of the machine—as is shown by the arrows in Fig. 4, compelling the bale to rotate in a forward direction, as is similarly indicated in the same figure, since the bale while being formed rests upon the said rollers 43 and 44.

In order that the driving-gear 26, which slides upon and turns with the line-shaft 22, shall have corresponding movement with the carriage D, links 50 are loosely mounted on the rear roller-shaft 44^a at each side of the gear 47 and upon the line-shaft 22 at each side of the gear 26, as is illustrated in Fig. 3.

The core or supporting stick F for the bale E, as is shown in Fig. 5, is made in two lon-

gitudinal sections 51 and 52, the body members of which sections are somewhat longer than the proposed length of the core of the bale and are semicircular in cross-section, their opposing surfaces being flat. The handle member 53 of each section 51 and 52 is circular in cross-section and is provided with a grip loop or projection 53^a and two annular flanges 54 and 55. The inner flanges 55 are formed where the body members of the sections join their handle members and extend over the former, and a recess 56 is produced in the inner faces of the flanges 55 opposite the flat surfaces of the body members of the sections of the stick. When the sections 51 and 52 of the stick are brought together, the inner end of the body member of one section is passed into the flange-recess 56 of the other section, thus effecting a temporary lock between the sections, which can be quickly broken by drawing the sections outward in opposite directions.

The core-stick is placed in the slots 40 of the carriage-standards *d*, the flanges 54 and 55 engaging with the outer and inner surfaces of the standards, as is shown in Fig. 1.

In addition to the rollers 43 and 44 for rotating and supporting the bale E a pressure-roller 57 is employed to keep the bale in engagement with said supporting-rollers 43 and 44 and yet admit of the bale gradually increasing in size. This roller 57 is provided with trunnions 58, which are placed in the slots 40 of the carriage-standards *d*, and the said trunnions are provided with flanges 59 and 60 to engage with opposite surfaces of the standards, and when the bale E is to be removed the pressure-roller 57 is held at the top portions of the standards *d* out of the way of the bale by placing the trunnions of the roller in recesses 61 in the upper ends of forward or single-piece members 38 of the standards, as is shown in Fig. 4.

The open slivers G of fiber are received from the feed-rollers 34 and 35 by a trough 62, wide at its forward or receiving end and contracted at its rear or discharge end, the width of the discharge end of the trough being substantially the same as the width of the depression 36 in the lower feed-roller 35, and the receiving end of the trough is directly opposite the said depression 36, while the discharge end closely approaches the carriage D, as is shown in Figs. 3 and 4. The trough 62 is supported by an upright 63 from a base beam or bar 64, secured to the main frame between the forward and intermediate members A and C of said main frame.

It will be observed that the feed-rollers 34 and 35 not only feed the fiber to the baling mechanism, but also serve to spread the fiber and retain it in its natural straight or open condition, and that the trough 62 is virtually a fixed guide, insuring the fiber reaching the baling mechanism in the same condition in which it leaves the feed-rollers.

In operation, the standards *d* being in their upright position, the core-stick F is placed between the said members of the standards, and the slivers of fiber passed through the guide-trough 62 are initially wound upon the core-stick, and the pressure-roller 57 is placed in position to engage with the material on the stick. When the traverse shaft 14 is set in motion, the carriage travels at the outlet end of the guide-trough backward and forward, and the rotation of the bale-supporting rollers 43 and 44 effect the formation of a bale, the slivers being spirally crossed in such operation. As the bale increases in diameter the pressure-roller 57 rises, always in engagement with the bale and exerting downward pressure thereon. When the bale is of suitable size, the sections of the core-stick are drawn out from the bale, leaving an exceedingly small core, and the bale will have been compactly wound, owing to the action of the pressure-roller 57. When the bale is ready to be removed from the machine, the pressure-roller 57 is lifted and supported in the recesses 61 in the standards, and the sections 39^b of the standard members 39 are dropped and the bale is rolled out on said sections as on a track. Thus by connecting skids or like devices to the said drop-sections 39^b the bale may be rolled to the floor without trouble, or it may be taken directly from said standard-sections 39^b by a truck or other vehicle.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In machines for baling fiber, a feeding and spreading device for the fiber, a traveling winding mechanism, and a guide for the fiber between the feeding and spreading device and the winding mechanism.

2. In a machine for baling fiber, a feeding and spreading device, a winding mechanism having traverse motion relative to the feeding and spreading device, and a guide for the fiber between the feeding and spreading device and the winding mechanism, as and for the purpose set forth.

3. In a machine for baling fiber, feeding and spreading rollers, a carriage having movement in a line parallel with the rollers, a winding mechanism on the carriage, and a stationary guide for the fiber between the rollers and the winding mechanism.

4. In a machine for baling fiber, feeding and spreading rollers, a carriage having movement on a line parallel with the rollers, a winding mechanism on the said carriage, means for imparting a traverse motion to the carriage, and a stationary guide for the fiber, receiving the same from the feeding and spreading rollers and delivering the fiber to the winding mechanism, as described.

5. In a machine for baling fiber, a feeding and spreading mechanism, consisting of an upper roller, a lower roller of greater width than the upper roller, the lower roller being provided with a peripheral depression, in which depression the upper roller travels, a

carriage, means for imparting a traverse motion to the carriage in a line parallel with the said rollers, a winding mechanism on the said carriage, and means between the feeding and spreading mechanism and the winding mechanism for delivering the fiber to the winding mechanism in the same condition in which it leaves the feeding and spreading mechanism as and for the purpose described.

6. In a machine for baling fiber, a support for the bale, consisting of a base, standards extending upward from the base, each of which standards is provided with a longitudinal slot dividing the upper portion of the standards in opposing members, corresponding members of each standard being constructed in sections, the uppermost of which sections are adapted to drop and form rails upon which the bale is to move, as described.

7. In a machine for baling fiber, a bale-support having drop-sections adapted as tracks to assist in the removal of the bale, as set forth.

8. In a machine for baling fiber, a reciprocating carriage having end standards, a bale-core loosely mounted in the standards, revoluble rollers mounted in the carriage for supporting and revolving the bale, a pressure-roller loosely mounted in the standards of the carriage for holding the bale in engagement with the supporting-rollers, and feed-rollers for feeding the fiber, as set forth.

9. In a machine for baling fiber, a reciprocating carriage having slotted-end standards, a bale-core mounted in the slots of the standards, rollers for supporting and revolving the bale mounted in the carriage, means for revolving the rollers in unison with the movement of the carriage, a pressure-roller mounted in the standards above the bale-core, and feed and spreading rollers, one roller being of greater width than the other, the wider roller being provided with a peripheral depression, as set forth.

10. In a machine for baling fiber, a support for a bale, consisting of a base, standards extending upward from the base, said standards being provided with vertical slots extending from their upper edges and each having a pivoted section, rollers for imparting rotary movement to a bale when in the support, which rollers are mounted at each side of the slots in the standards, and a pressure-roller the trunnions whereof have sliding movement in the slots of the standards, the said standards being provided with recesses at their upper ends to receive the trunnions of the pressure-roller and hold said roller out from the slots in the standards, as set forth.

11. In a machine for baling fiber, a winding mechanism, a feeding and spreading device comprising two rollers, one of which is provided with a peripheral recess in which the other works, and a trough arranged between the winding mechanism and the feeding and spreading device, the discharge end of the trough being substantially the same width as the depression of the said feed-roller, as set forth.

12. In a machine for baling fiber, the combination with vertically-slotted standards, of a core-stick made in two longitudinal sections and each provided at one end with spaced annular flanges, the inner flanges being recessed, the core-stick being placed in the slots of the standards with the flanges engaging the outer and inner surfaces of the standards, as set forth.

13. In a machine for baling fiber, a reciprocating carriage having slotted standards, a core-stick upon which the fiber is wound, said stick being loosely mounted in the slots of the standards, revoluble rollers upon which the bale is supported and by which it is rotated, and a pressure-roller mounted in the slots of the standards above the core-stick and serving to hold the bale in engagement with the supporting-rollers, as set forth.

14. A machine for baling fiber, comprising a reciprocating carriage having slotted end standards, supporting-rollers mounted in the carriage, a core-stick mounted in the slots of the standards of the carriage, a pressure-roller also mounted in the slots of the said standards and serving to hold the bale in engagement with the supporting-rollers, feed-rollers for feeding the fiber to the core, and means for operating the carriage, the supporting-rollers, and the feed-rollers in unison, as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHN JOSEPH DAVENPORT.

Witnesses:
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