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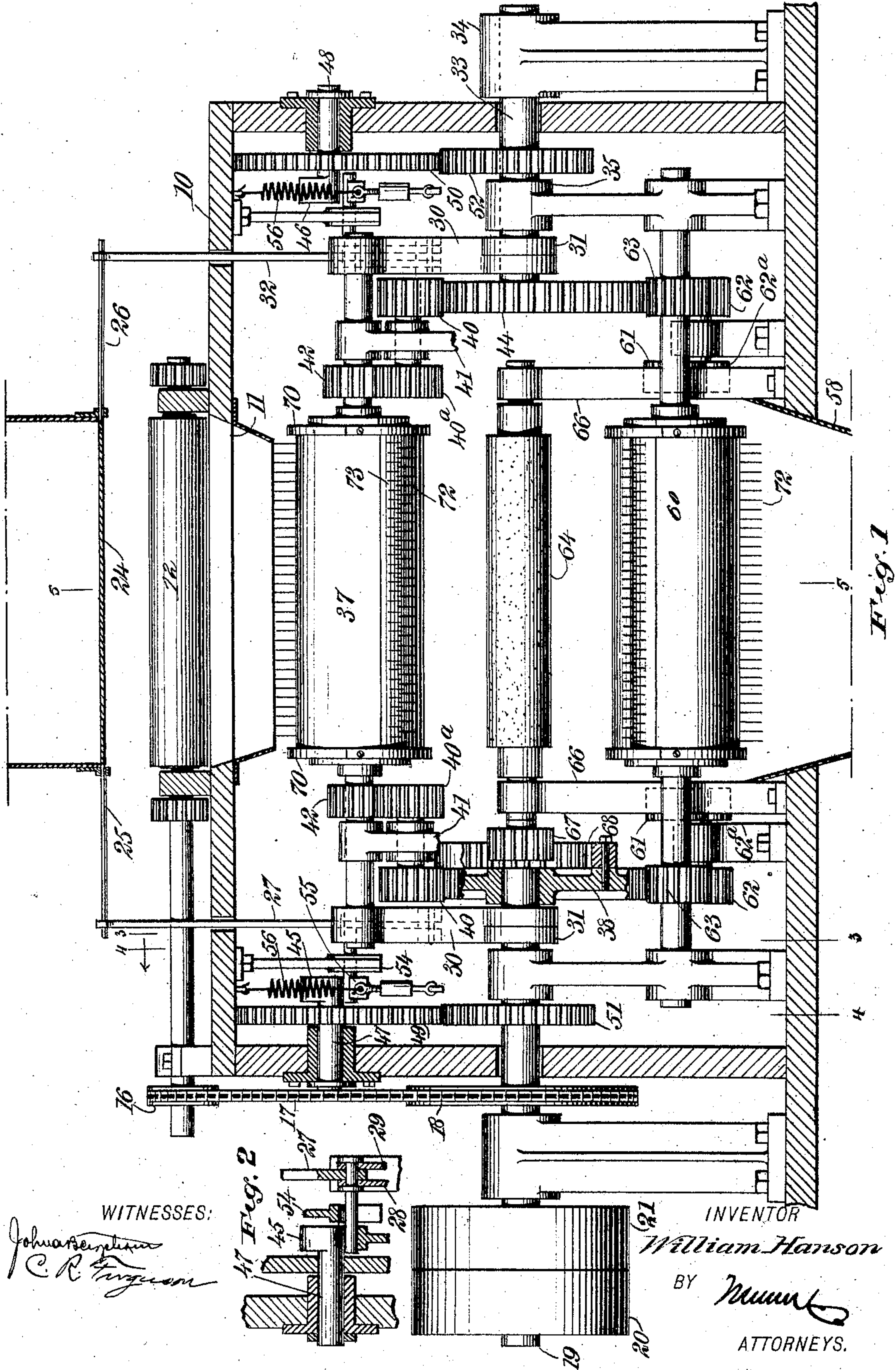
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W. HANSON.  
MACHINE FOR MAKING VEGETABLE HAIR.

APPLICATION FILED DEC. 18, 1902.

NO MODEL.

3 SHEETS—SHEET 1.





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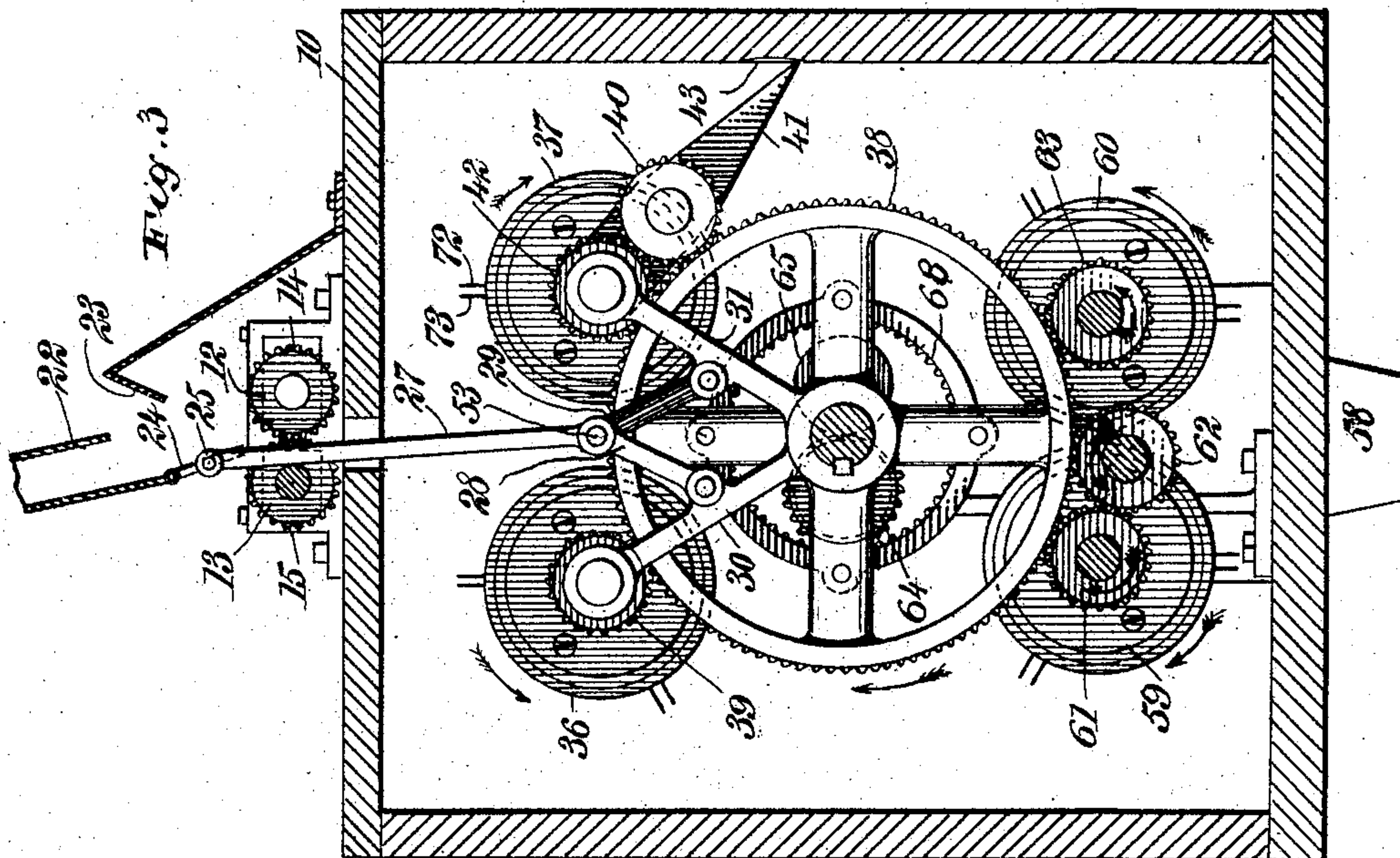
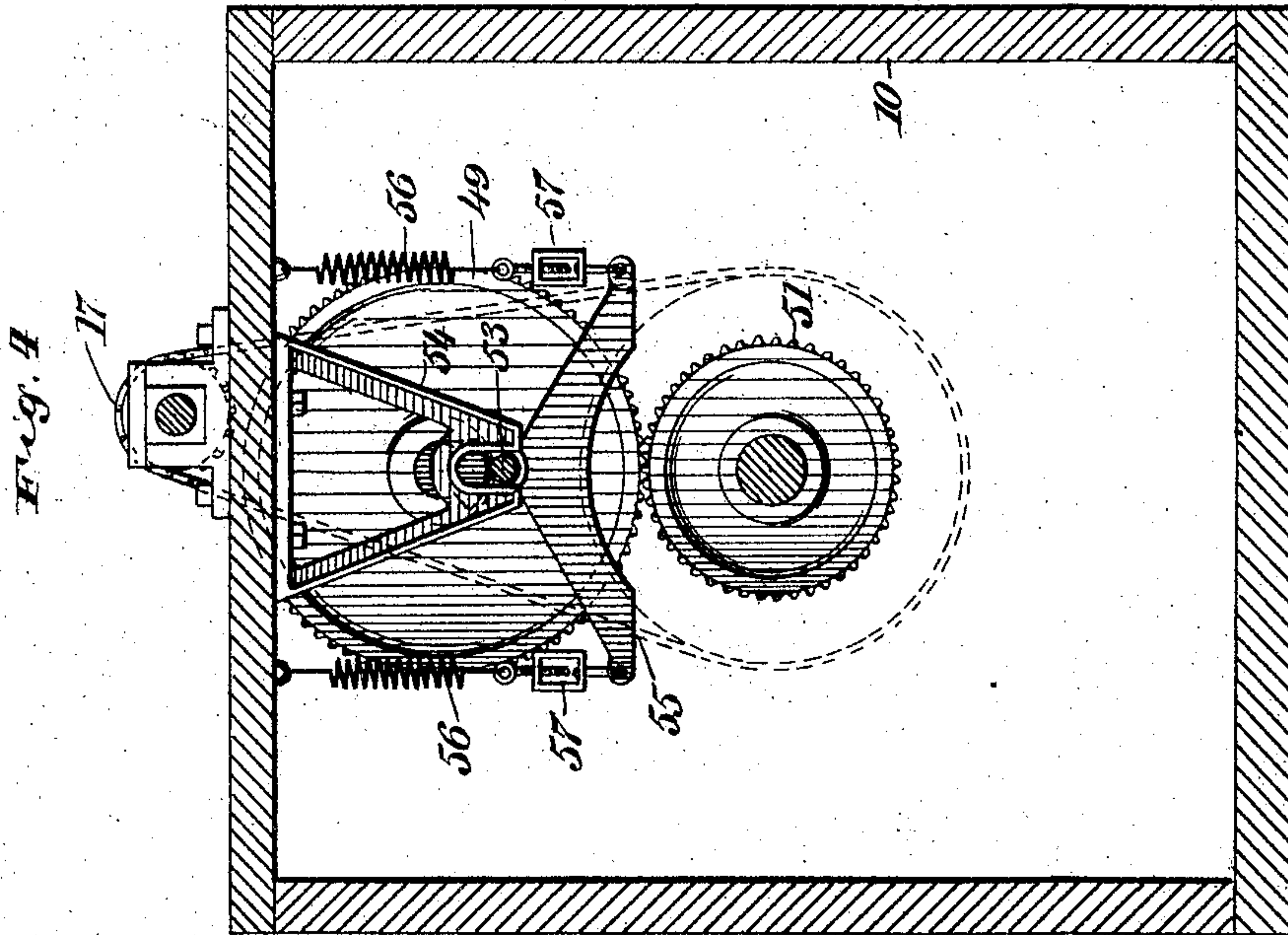
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WITNESSES:

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*C. R. Ferguson*

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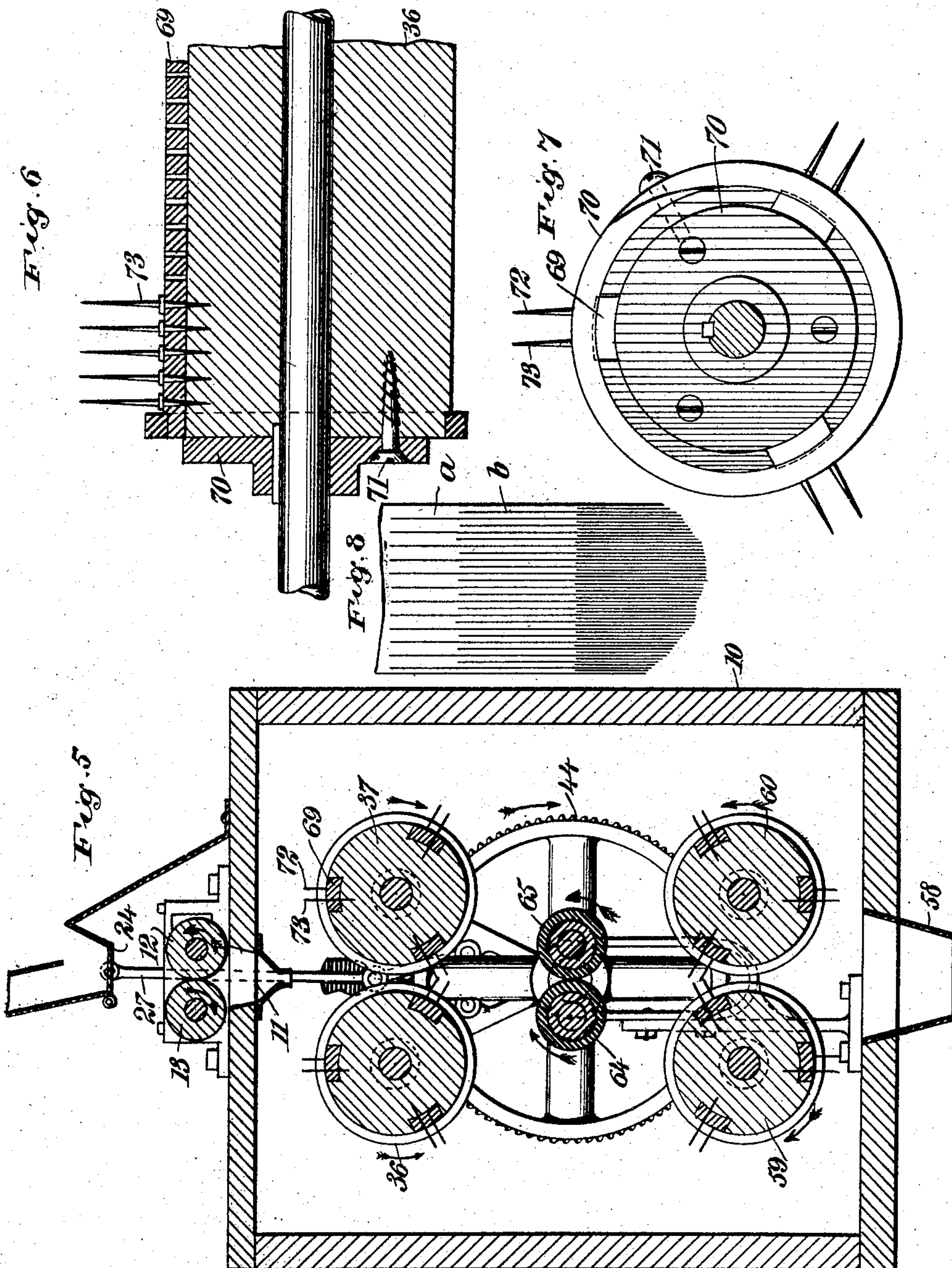
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3 SHEETS—SHEET 3.



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# UNITED STATES PATENT OFFICE.

WILLIAM HANSON, OF FORT MYERS, FLORIDA.

## MACHINE FOR MAKING VEGETABLE HAIR.

SPECIFICATION forming part of Letters Patent No. 765,481, dated July 19, 1904.

Application filed December 18, 1902. Serial No. 135,712. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM HANSON, a subject of the King of Great Britain, and a resident of Fort Myers, in the county of Lee and State of Florida, have invented new and useful Improvements in Machines for Making Vegetable Hair, of which the following is a full, clear, and exact description.

This invention relates to improvements in machines for making vegetable hair, the object being to provide a machine of this character by the means of which the product may be rapidly formed from the fans of certain kinds of palm or palmetto which grow wild and in vast abundance in the State of Florida and elsewhere.

The machine produces a product which bears a very striking resemblance to natural horsehair, but is considerably lighter than hair and can be sold at a much lower price. It is also more desirable than hair for sanitary reasons. By my invention the fans are split, shredded, or carded from end to end into separate individual filaments of a regular uniform gage, so as to have a textile caliber and resiliency similar to horsehair, thus resulting in economy over natural hair or other materials extensively employed for general stuffing, and the product can be dyed and curled, if desired.

I will describe a machine for making vegetable hair embodying my invention and then point out the novel features in the appended 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 sectional elevation of a machine for making vegetable hair embodying my invention. Fig. 2 is a sectional detail showing a mechanism for regulating the feed of the material. Fig. 3 is a section on the line 3 3 of Fig. 1. Fig. 4 is a section on the line 4 4 of Fig. 1. Fig. 5 is a section on the line 5 5 of Fig. 1. Fig. 6 is a longitudinal section of one of the carding devices employed. Fig. 7 is an end view thereof, and Fig. 8 illustrates the way of slitting or shredding the material forming the threads.

Referring to the drawings, 10 designates a casing in which the working parts are placed. The top of the casing has an inlet-opening 11, over which are feed-rollers 12 13, geared together at the ends by pinions 14 15. A shaft of one of the feed-rollers is extended to the end of the casing, where it is provided with a sprocket-wheel 16, from which a chain 17 extends to a sprocket-wheel 18 on a main driving-shaft 19, provided with fast and loose pulleys 20 21. One of the rollers (here indicated as the roller 12) will have its bearings in spring-pressed blocks, so that the said roller may have a yielding movement toward the other roller. Arranged above the feed-rollers is an inlet-spout 22 for the material, and arranged at one side at the lower end of this spout is an inwardly and downwardly inclined deflector-plate 23. The opening between the lower edge of this deflector-plate and the lower edge of the spout 22 is controlled by a door 24. Rods 25 26 extend outward from this door 24, and from the rod 25 an operating-rod 27 extends downwardly through an opening in the top of the casing and has pivotal connection with the short arms 28 29 of the lazy-tongs, the other members of the lazy-tongs consisting of the long arms 30 31, having pivotal connection with the short arms and mounted to rock on the driving-shaft 19.

The rod 26 has a rod connection 32 with the short arms of the lazy-tongs formed like the lazy-tongs above described—that is, having the long arms 30 31. These arms, however, are mounted to rock on a counter-shaft 33, extended through the end wall of the casing and having a bearing at its outer end in a pillow-block 34, and at its inner portion it has a bearing in a pillow-block 35. The rollers 36 37 have their shaft-bearings, respectively, in the arms 30 31. The object of this construction will hereinafter appear and the construction of the rollers will also be more fully disclosed.

Mounted rigidly on the driving-shaft 19 is a gear-wheel 38, which meshes with a pinion 39, attached to the roller 36, and also meshes with a pinion 40, mounted on an arm 41, mounted to swing on the shaft of the roller 37. Said arm also carries a pinion 40<sup>a</sup>, mesh-



ing with a pinion 42 on the said shaft. The end of the arm 41 extends into a curved slot 43, formed in a wall of the casing. On the counter-shaft 33 a gear-wheel 44 is mounted  
5 and engages with a pinion mechanism for operating the two rollers, the said pinion mechanism being the same as that before described.

It may be here stated that by placing the driving mechanism at each end a positive and  
10 even motion will at all times be imparted to the rollers. It will be seen in Fig. 3 that the rollers have their shaft-bearings in the long arms of the lazy-tongs.

Arranged at each end of the casing are cams  
15 45 46, mounted, respectively, on shafts 47 48, and on these shafts are gear-wheels 49 50, the gear-wheel 49 meshing with a gear-wheel 51 on the driving-shaft 19, while the gear-wheel 50 meshes with a gear-wheel 52 on the counter-  
20 shaft 33. The cams 45 46 are designed to control the opening and closing of the inlet-door 24 and also are designed to cause the movement of the rollers 36 and 37 laterally to and from each other. A connecting-pin 53  
25 for the short arms of the lazy-tongs extends outward through a slotted guide-hanger 54 and is held yieldingly against its cam, each pin having a bearing in a cross-head 55, connected by means of springs 56 with the top of  
30 the casing. For the purpose of providing for the adjustment of the springs they are connected to the cross-heads by means of turn-buckles 57.

In the lower portion of the casing is a discharge-outlet 58, and above this discharge-outlet are what may be termed the "finishing hackling-rollers" 59 60. The shaft of the roller 59 is provided with pinions 61, meshing with pinions 62<sup>a</sup>. Pinions 62 engage with  
40 the gear-wheels 38 and 44, and the said gear-wheels 38 and 44 mesh with pinions 63 on the shaft of the roller 60.

It may be here stated that the upper rollers 36 37 rotate in a direction opposite the downward movement of the material operated upon.  
45 The lower rollers, however, rotate in the direction of the movement of the material. Arranged between the upper and lower sets of carding-rollers are feeding-rollers 64 65, which  
50 are preferably covered with rubber or similar yielding material. These rollers have bearings in standards 66 and the shaft of one of the rollers is provided with a pinion 67, meshing with an interior gear-wheel 68, attached  
55 to the gear-wheel 38. The other roller is driven by suitable gearing with the first roller having the pinion 67. Such gearing may consist of rawhide having frictional contact, so that the parts will rotate smoothly and with  
60 little or no noise.

The following method of arranging the teeth of the hackling-rolls is an essential feature of the machine, it being understood that the object is to shred the fans into strips of a definite

uniform size of about one forty-eighth of an  
65 inch in width without chopping or tearing the fans. Seated longitudinally in each roller is a series of brass or other metal plates 69, which are held in place by split rings 70 at the ends of the roller and held in place by  
70 screws 71. On each plate 69 there are two rows of teeth 72 73. The teeth being one-fourth of an inch apart-centers in the rows, and the rows are one-third of an inch apart. As  
75 there are three plates 69 on a roller, of course there will be six rows of teeth. Each row is advanced in echelon from No. 2 to No. 6 one twenty-fourth of an inch to the right of the  
80 preceding row, and the holes for the carding-teeth are drilled in the brass plates accordingly. From this it will be seen that at each  
85 revolution of the rollers, three hundred per minute, the fan is split into strips one twenty-fourth of an inch wide. The opposite roller  
90 of each pair is adjusted so that its teeth strike the solid surface of the fan about one inch, more or less, behind the teeth of the first-named roller and exactly midway between  
95 them. In this way the one-twenty-fourth-of-an-inch strips are divided into one-forty-eighth-of-an-inch filaments, the caliber desired.

The body portions of the rollers consist for the sake of lightness of wood—such, for instance, as beech—and metal plates are secured  
95 at the ends to rigidly secure the rollers to their shafts.

In the operation the palmetto fans are previously trimmed and prepared by another machine, and this prepared material is fed to the  
100 machine here described. The material will be fed into the feed-pipe 22 at the normal rate of one pair of fans every two seconds of time. This is the calculated speed of the machine; but with the rapidity resulting from practice  
105 the operator will be able to keep pace with a higher rate of speed. The fans are arrested at the lower end of the feed-spout by the door 24. This door will be opened, allowing the fans to pass through for the space of one-half  
110 second in every two seconds of time. This door, of course, will be opened by the cam mechanism hereinbefore described and closed by the springs 56. The movement of the cams to open said door also spreads or moves apart  
115 the upper rollers 36 37, permitting the material to pass between them to the rollers 64 65, and these rollers 36 37 will move toward each other simultaneously with the closing of the door. The material will pass from the upper  
120 carding-rollers between the rubber rollers 64 65 and thence to the lower carding-rollers. One of the upper carding-rollers will cut the fans or material into strips substantially like  
125 *a* in Fig. 8, while the second upper roller will separate these strips *a*, forming narrow strips *b* one forty-eighth of an inch wide.

Further, in regard to the operation it may



be well to state that the palmetto fans after being truncated three inches above the stalk, so as to liberate their accordion-like plaits in order that the steel rolls on top may flatten  
 5 out their corrugations and average eighteen inches in length. The sphere of usefulness of the upper pair of rolls is limited to the upper half of the fan. This part they hackle, the lower half having passed intact on down  
 10 to the rubber rolls, while the upper rolls are separated. The lower rolls hackle the lower half, and when the hackled top portion reaches them they merely pass it on or discharge it.

If filaments of a fine textile caliber less than  
 15 one forty-eighth of an inch are desired, they can be made by increasing the number of equidistant double rows of teeth on the four carding-rollers, always maintaining a center distance of one-fourth of an inch, however,  
 20 between the teeth in every row, but making the echelon advance of each row to the right of the preceding row such fraction of an inch as will result from the multiplication of the number of rows in one roll by four. For exam-  
 25 ple, six rows multiplied by four equals twenty-four minus echelon advance, one twenty-fourth of an inch. Eight rows multiplied by four equals thirty-two minus echelon advance, one thirty-second of an inch. Ten rows multiplied  
 30 by four equals forty minus echelon advance, one fortieth of an inch. Twelve rows multiplied by four equals forty-eight minus echelon advance, one forty-eighth of an inch. The caliber of the resulting filament will be one-  
 35 half the echelon advance or one forty-eighth of an inch, one sixty-fourth of an inch, one eightieth of an inch, and one ninety-sixth of an inch, respectively.

The entire length of the palmetto fan passes  
 40 through the lower pair of carders. The upper pair are designed to act only upon the superior half of the fan, the flimsy serrated tips of which evade the teeth unless carded in an opposite direction to their onward traction by  
 45 the central rubber feed-rolls 64 65.

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

1. In a machine for making vegetable hair, an upper pair of hackling-rollers and movable  
 50 laterally, a lower pair of hackling-rollers operating in a direction opposite to that of the upper rollers, feeding-rollers between the upper and lower pairs of hackling-rollers and having a yielding exterior, a feed-controlling  
 55 door, and means operated by lateral move-

ments of the upper hackling-rollers for opening and closing the door at regulated intervals.

2. In a machine of the character described, upper hackling-rollers, means for moving the said hackling-rollers toward and from each  
 60 other, a feed-controlling door, and means for opening said door during the spreading movement of said rollers, lower hackling-rollers, and rubber-covered rollers arranged between the upper and lower pairs of hackling-rollers. 65

3. In a machine of the class described, a pair of upper hackling-rollers, a pair of lower hackling-rollers, feeding-rollers arranged between the upper pair and the lower pair of  
 70 hackling-rollers, feed-rollers arranged above the upper pair of hackling-rollers, a feed-spout above said feed-rollers, a controlling-door for the outlet of said feed-spout, and means for simultaneously operating said door  
 75 and moving the said upper hackling-rollers from and toward each other.

4. In a machine of the character described, a pair of upper hackling-rollers movable laterally, a feed-controlling door operated by lateral movements of said hackling-rollers, a  
 80 pair of lower hackling-rollers, means for rotating the upper and lower pairs of rollers in opposite directions one pair relatively to the other, and yielding rollers arranged between said upper rollers and said lower rollers. 85

5. In a machine of the character described, a casing, upper hackling-rollers arranged therein, lower hackling-rollers arranged in the casing, lazy-tongs at the ends of the upper  
 90 rollers and in the long arms of which said rollers have their bearings, pins extended outward from the shorter arm of said lazy-tongs, cams for engaging with said pins for spreading the lazy-tongs, spring-yielding bearings for said pins and adapted to move the lazy-  
 95 tongs to closing position, an inlet at the upper portion of the casing, a feed-spout above said inlet and having a controlling-door, and means operated by said cams and the springs, for opening and closing said door synchro-  
 100 nously with the outward and inward movements of the upper rollers.

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

WILLIAM HANSON.

Witnesses:

A. J. REYNOLDS,  
 E. L. EVANS.