

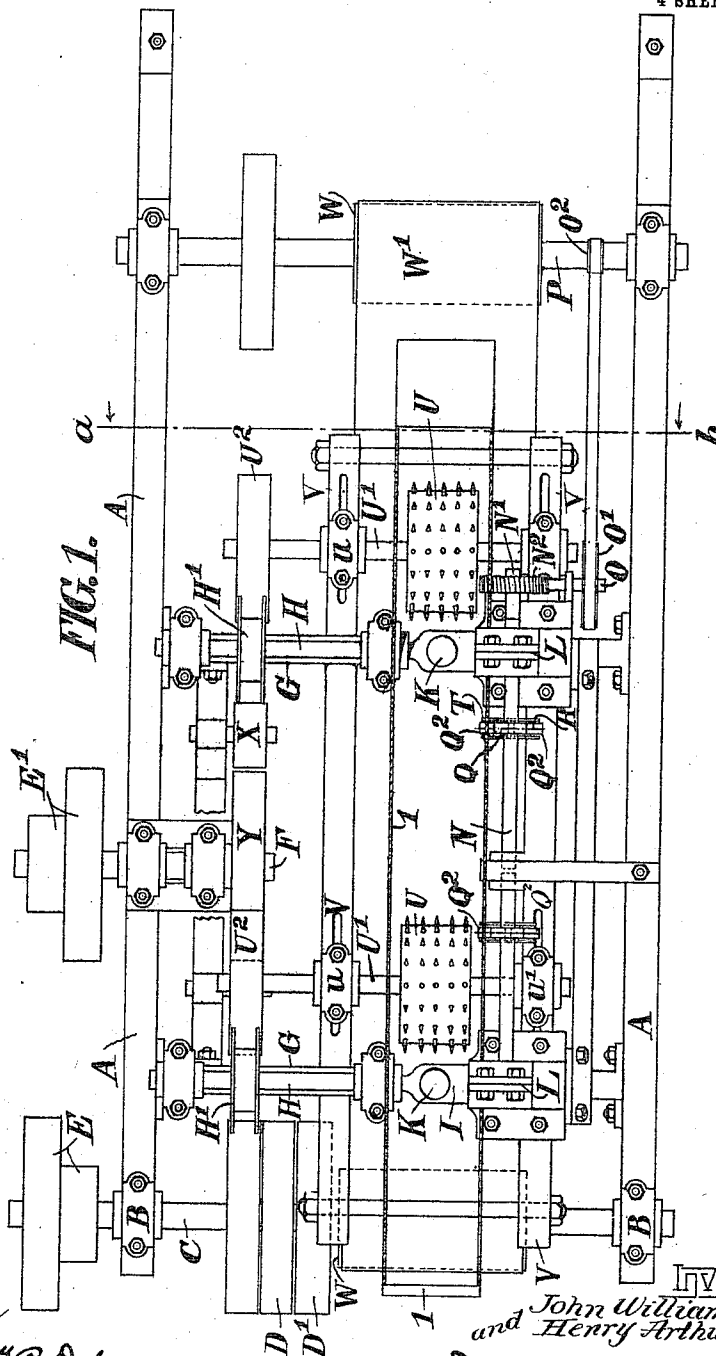
J. W. & H. A. BORE.
 APPARATUS FOR UNTWISTING, BREAKING UP, AND TEASING THE FIBERS IN THE FORM
 OF ROPES AND THE LIKE.

986,351.

APPLICATION FILED JAN. 28, 1909.

Patented Mar. 7, 1911.

4 SHEETS-SHEET 1.



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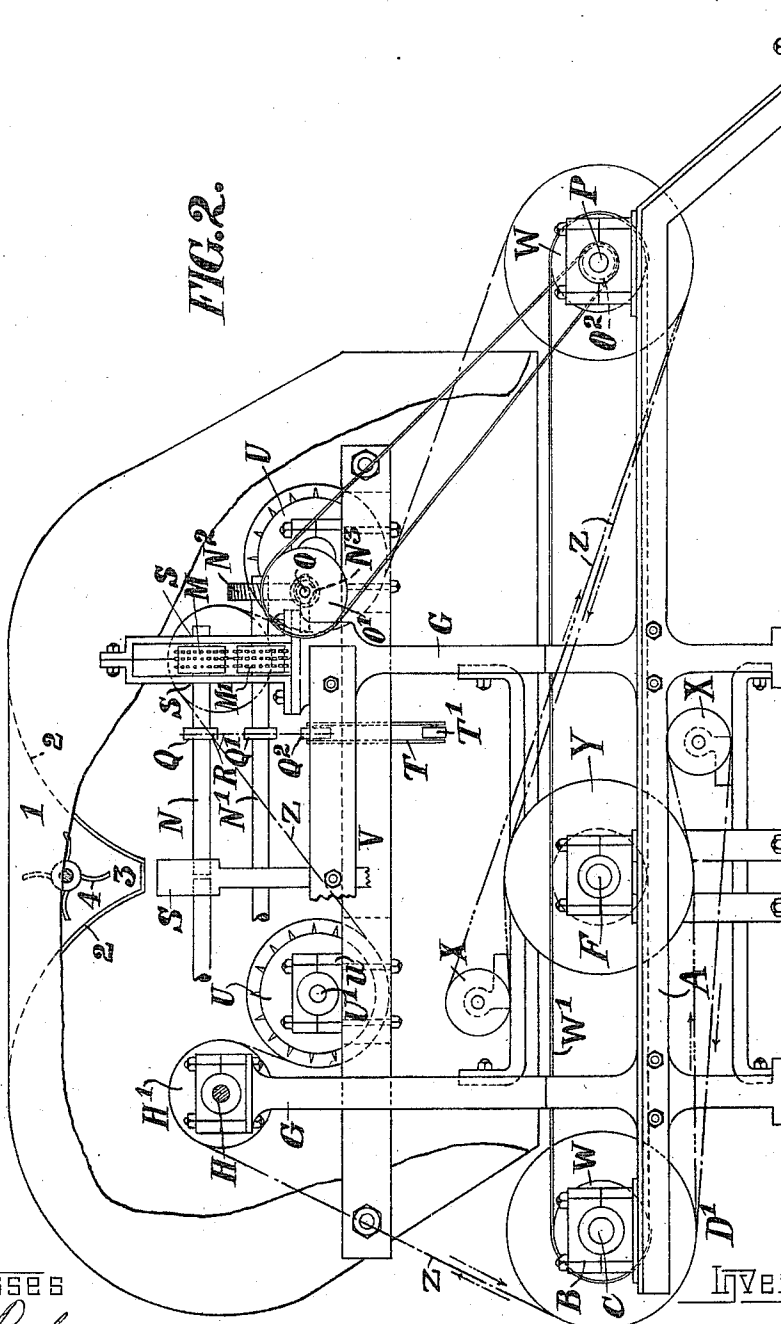
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4 SHEETS-SHEET 2.

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FIG. 2.



Witnesses

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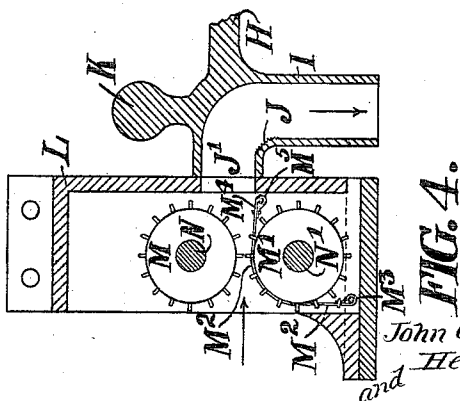
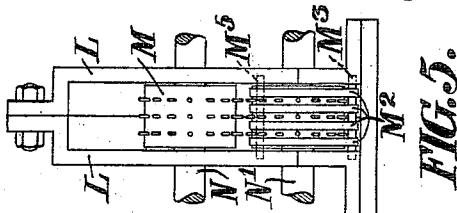
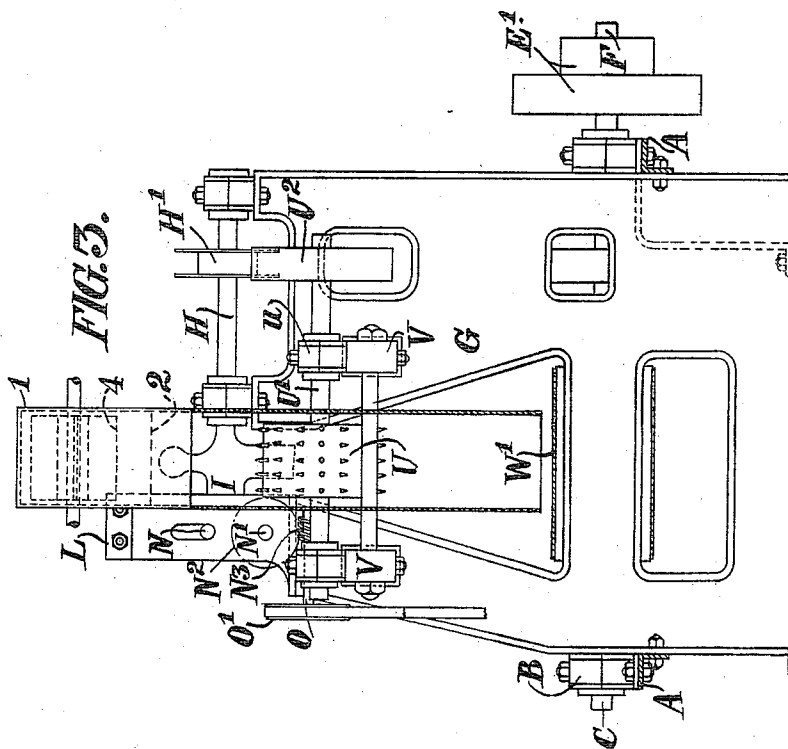
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4 SHEETS—SHEET 3.



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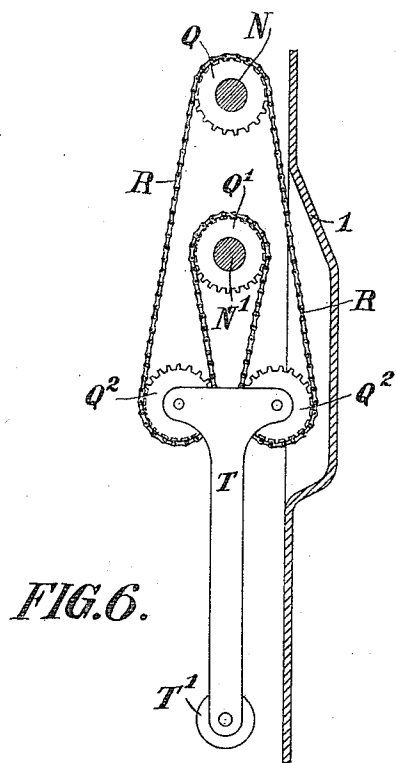


FIG. 6.

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UNITED STATES PATENT OFFICE.

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APPARATUS FOR UNTWISTING, BREAKING UP, AND TEASING THE FIBERS IN THE FORM OF ROPES AND THE LIKE.

986,351.

Specification of Letters Patent. . Patented Mar. 7, 1911.

Application filed January 28, 1909. Serial No. 474,715.

To all whom it may concern:

Be it known that we, JOHN WILLIAM BORE and HENRY ARTHUR BORE, subjects of the King of Great Britain, residing at Liverpool, in the county of Lancaster, in the Kingdom of England, have invented certain new and useful Improvements in Apparatus for Untwisting, Breaking Up, and Teasing the Fibers in the Form of Ropes and the Like, of which the following is a specification.

This invention relates to improvements in apparatus for untwisting, breaking-up and teasing curled fibers or curled hair or other fibers in the form of ropes and the like for upholstery, and has for its object the construction of a machine, whereby this untwisting, breaking-up and teasing operation is accomplished in a more efficient and expeditious manner than hitherto.

In the accompanying drawings:—Figure 1 is a plan view of a two spindle machine constructed in accordance with our invention; and Fig. 2 is a side elevation, having part of the casing removed for purpose of better illustration; Fig. 3 is a cross section on line *a b* of plan looking in direction of arrow; Fig. 4, an enlarged detail of feed rollers and revolving nozzle; Fig. 5, an elevation of same; and Fig. 6 is a detail view of the feed roll driving mechanism.

In the accompanying drawings the driving mechanism is only shown applied to one set of feed rollers, but it will be readily understood that the driving of the second pair is a repetition of the first arrangement.

The side frames of the machine are indicated by the letter A, A. Mounted in suitable bearings B, is the driving shaft C provided with fast and loose pulleys D, D¹ respectively driven from a line of shafting or the like in any convenient manner; on the end of shaft C is keyed the two speed pulley E for imparting motion by means of belting to two speed pulley E¹ keyed on counter shaft F. Supported by cross frame G is shaft H having a flanged pulley H¹; attached to one end of said shaft is nozzle I turned at right angles at J, the inner surface at this point being roughened, and having counter weight K. The inlet J¹ of nozzle I is in close proximity to frame L, made in two halves between which are mounted top and bottom spiked feed rollers M, M¹, secured on shafts N, N¹, respectively; motion being imparted to shaft N¹ by worm wheel

N² gearing with worm N³ on shaft O through pulley O¹ which in turn receives motion from pulley O² on shaft P. In order to insure the rope on leaving the feed rollers M, M¹, entering the nozzle I, a number of guide plates M² are attached to pin M³ at one end, the opposite end M⁴ connected to a similar pin M⁵. The shaft N has a sprocket wheel Q and is driven by chain R from sprocket wheel Q¹ on shaft N¹. The shaft N is mounted in bearings S, S, S, and has a free vertical movement in order that the feed rollers may adapt themselves to the varying diameters of ropes to be fed to the machine. The sprocket driving chain R passes under two tension sprocket wheels Q² carried by bracket T provided with a weight T¹ so that any variation in distance between the centers of the two sprocket wheels Q, Q¹, due to the varying diameter of rope fed to the machine is compensated for. In close proximity to the revolving nozzle I is a spiked teasing cylinder U secured on shaft U¹ which is provided with pulley U². The shaft U¹ is mounted in adjustable bearings *u, u*¹, supported by smooth slotted gauntrees or beams V, V, carried by cross frames G. The bearings are held by bolts passing through the slots in the gauntrees V and may be adjusted by loosening the nuts on the bolts, moving the bearing to the desired position and then tightening the nuts in the usual manner. Or in place of these the frame formed of the beams V with the bearings is adjustable. By thus mounting the shaft U¹ in adjustable bearings or on an adjustable frame the cylinder U may be moved away from or nearer to the revolving nozzle I as may be required according to the quality of rope that is being broken up.

W, W, are rollers carrying an endless traveling apron W¹ which receives the fiber after treatment and is arranged to convey and deliver the material where desired.

X, X, are adjustable tension pulleys. Motion to the various shafts is derived from pulley Y on counter shaft F by means of driving belt Z shown by dot and dash line in Fig. 2. If it is desired to drive the revolving nozzle I in the opposite direction the said belt Z is passed around the various pulleys as indicated by three dots and dash line in same figure. The revolving nozzles I and spiked cylinders U are inclosed by a casing 1 having an inner perforated or like

tray 2 which will permit of dust passing through into the space 3 from which it is extracted and discharged in any convenient manner by a fan 4.

5 The mode of action is as follows:—The various parts of the machine having been set into motion through the mechanisms and connections described, the end of a rope to be teased is started between the feed rolls
10 M, M¹. Since the shaft N is mounted to move in guides, the roll M carried thereby readily accommodates itself to the size of the rope entering between the rolls, and the rope is drawn in between the rolls by the
15 spikes carried by the latter, and is thus fed forward as they rotate. After passing between the rolls the rope is lifted from the spikes by the plates M² lying between the rows of spikes, and is directed by these
20 plates into the axial inlet J¹ of the angular nozzle I. Since the plates M² are attached at both ends to the frame L, and bear upon the roll M¹ only at their middle portions, there is no tendency to cut or catch the rope,
25 but it is fed smoothly into the nozzle I. This nozzle is rotating at high speed on the shaft H, and its passage being bent at right angles at J, the rope passes out from the nozzle in a direction radial to the axis of
30 rotation of the nozzle I, and is whirled around in a plane approximately normal to the axis of rotation of the nozzle, centrifugal force tending to hold the end of the rope out radially and to draw an increasing
35 length of rope from the nozzle. The nozzle passage is roughened at J, as stated, and this causes sufficient frictional engagement between the nozzle and the rope to produce an untwisting of the rope between
40 the feed rolls M, M¹ and the portion J of the nozzle, the direction of rotation of the nozzle being reversible by the means described so as to be opposite to the direction of twist of the rope teased. The rope being
45 thus untwisted and loosened, the shorter fibers fly off by centrifugal force on leaving the nozzle, but the main portion of the rope end whirls around as described, and is repeatedly struck upon the rotating teasing
50 cylinder U, so that the rope end is disintegrated as fast as fed forward. In this separated or divided state it falls upon the apron W¹, and is conveyed thereby away from the machine. The process of teasing
55 the rope is thus a continuous one, and includes four elements, first, an untwisting; second, a centrifugal disintegration which we shall designate in the following claims as a "centrifugal action"; third, disintegration
60 by impact upon the spiked teasing cylinder; and, fourth, a combing or teasing action of this cylinder as the end of the rope is drawn across it. The proportionate part in the process played by each element and various
65 details of the operations, may vary consid-

erably with the speed at which the machine is driven, and with the character of the rope. It has been found desirable to have considerable range of adjustment of the distance
70 between the rotating nozzle and the cylinder U, to accommodate different kinds and qualities of rope, as these vary greatly in the length of fiber.

We declare that what we claim is:—

1. In a rope untwisting, breaking-up and
75 teasing machine, the combination of means for untwisting the rope and for causing the end to rapidly whirl around in a plane at right angles to the axis of rotation and a
spiked device in the plane of rotation of the
80 rope end, whereby the untwisted rope is teased.

2. In a rope untwisting, breaking-up and teasing machine, a right angled nozzle,
85 means for revolving the same on the axis of one of its arms, and means for feeding the rope into the nozzle in the direction of the axis of rotation, the nozzle being rounded
at the angle, and of sufficient size to allow
90 the rope to pass through it, whereby the end of the rope is rapidly revolved, and an untwisting and centrifugal action is obtained.

3. In a rope untwisting, breaking-up and teasing machine, the combination of spiked
95 feed rollers, a right angled nozzle revolving at considerable speed, and a spiked roller in the plane of revolution of the delivery end of the right angled nozzle, whereby if
a rope be fed through the feed rollers, and
100 right angled nozzle, it will be teased on the spiked teasing rollers.

4. In a rope untwisting, breaking-up and teasing machine, the combination of a rotating
105 nozzle having an outlet guide approximately radial with respect to the axis of rotation; means for paying rope out through the nozzle; a spiked teasing roller in the path of the rope paid out from said
nozzle; bearings for the same; and gaunt-
110 trees along which the bearings are adjustable, whereby the spiked roller can be adjusted to any required distance from the nozzle.

5. In a rope untwisting, breaking-up and teasing machine, spiked feed rollers, means
115 for driving the same, a right angled nozzle, means for rapidly revolving the same, whereby an untwisting and centrifugal action are obtained, a spiked teasing roller mounted in
bearings permitting adjustment, means for
120 driving the same, a casing having an inner perforated tray inclosing the untwisting and breaking-up device; a fan; and means for driving the same for extracting the
dust from the material being treated. 125

6. In a rope untwisting, breaking-up and teasing machine, the combination of means
for whirling a rope end around at right
angles to its axis of rotation; a roller adapted
to feed rope to said means; strippers for 130

said roller; a spiked teasing roller in the plane of rotation of the rope end; and means for conveying the teased material away.

7. In a device of the class described, the
5 combination of an L-shaped nozzle mounted to rotate axially about one of its arms and having a guide passage adapted to receive a rope through said axial arm and discharge it through the other arm; serrations upon
10 a portion of the walls of the guide passage; driving connections for the nozzle; mechanism for feeding rope to the nozzle; and a teasing device adjacent the discharge end of the nozzle.

15 8. In a device of the class described, the combination of an L-shaped nozzle mounted to rotate axially about one of its arms and having a guide passage adapted to receive a rope through said axial arm and discharge
20 it through the other arm; driving connec-

tions for the nozzle; mechanism for feeding rope to the nozzle; and a teasing device adjacent the discharge end of the nozzle.

9. In a device of the class described, the combination of means for untwisting a
25 rope and for causing the untwisted end of the rope to whirl around at approximately right angles to its axis of rotation, and a teasing device in the path of the untwisted
30 rope end.

In witness whereof, we have hereunto signed our names this 11th day of January 1909, in the presence of two subscribing witnesses.

J. W. BORE.
H. A. BORE.

Witnesses:

H. WILLIAMS,
W. R. SIMONS.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."