

E. H. ROONEY.
 COMBING MACHINE.
 APPLICATION FILED OCT. 25, 1909.

1,002,454.

Patented Sept. 5, 1911.

3 SHEETS—SHEET 1.

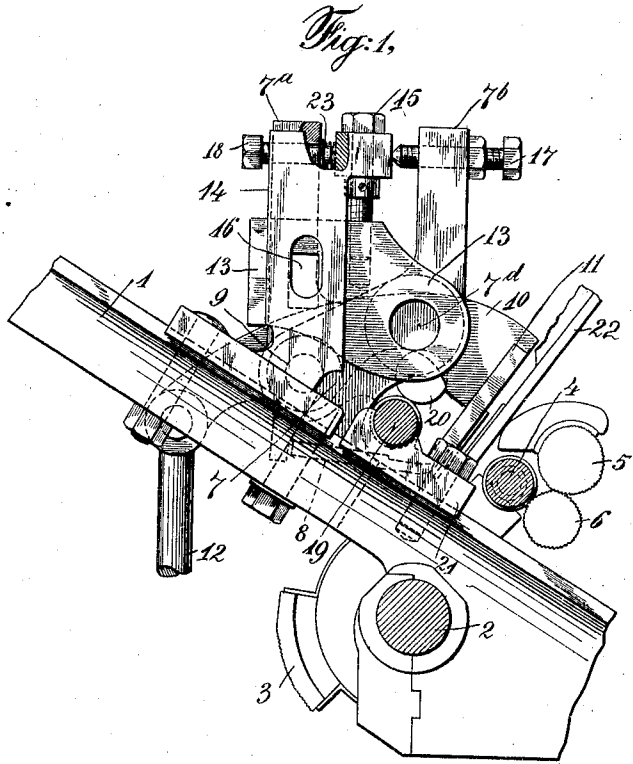
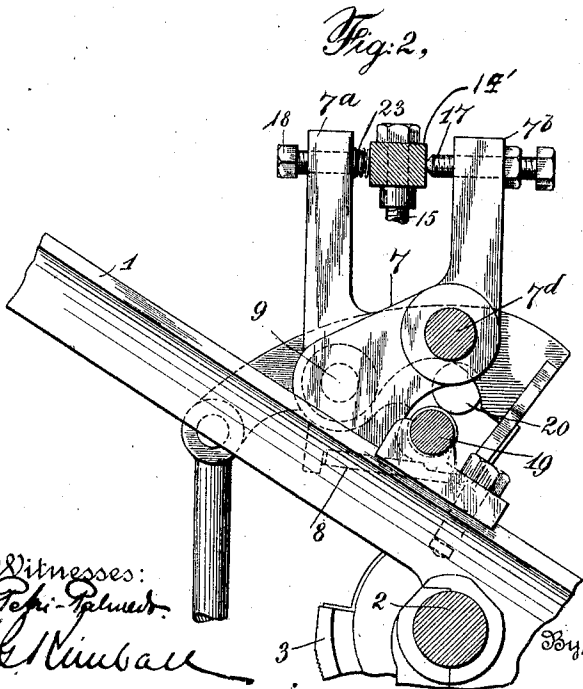
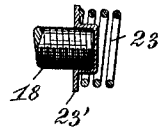


Fig. 1a,



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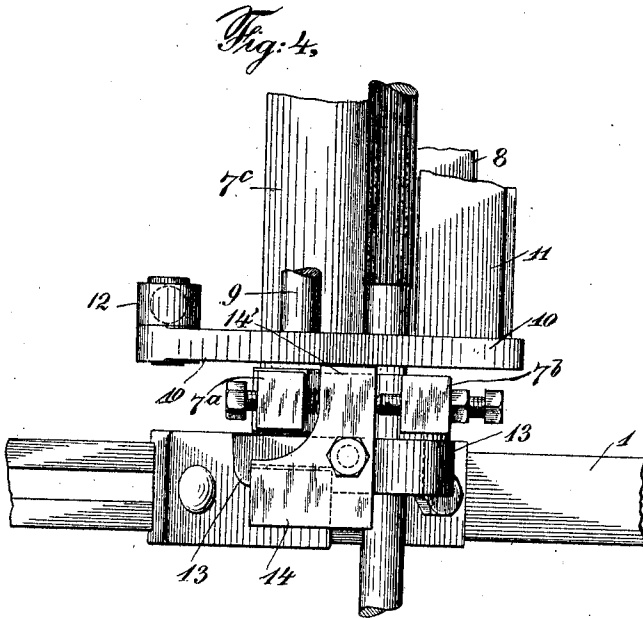
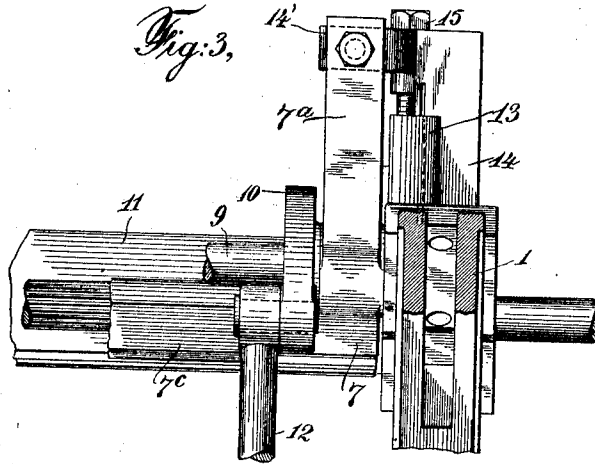
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3 SHEETS—SHEET 2.



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3 SHEETS—SHEET 3.

Fig. 5,

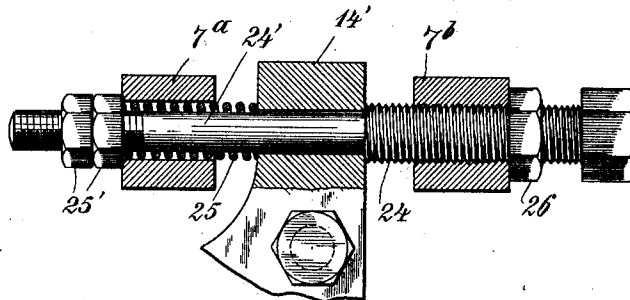


Fig. 6,

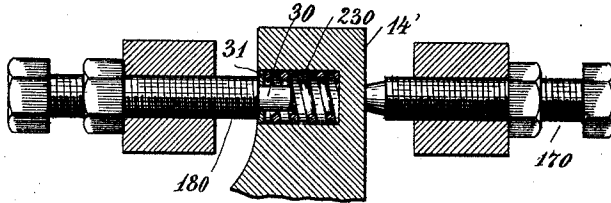
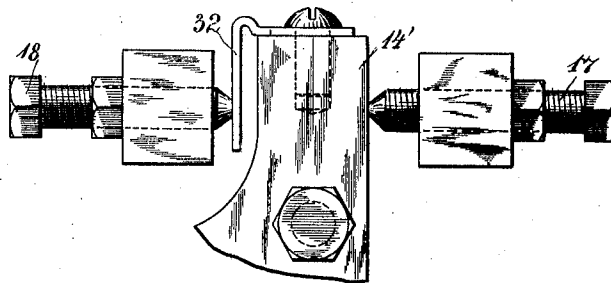


Fig. 7,



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UNITED STATES PATENT OFFICE.

ELWIN H. ROONEY, OF WHITINSVILLE, MASSACHUSETTS, ASSIGNOR TO THE WHITIN MACHINE WORKS, OF WHITINSVILLE, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

COMBING-MACHINE.

1,002,454.

Specification of Letters Patent.

Patented Sept. 5, 1911.

Application filed October 25, 1909. Serial No. 524,294.

To all whom it may concern:

Be it known that I, ELWIN H. ROONEY, a citizen of the United States, residing at Whitinsville, Worcester county, Massachusetts, have invented certain new and useful Improvements in Combing-Machines, of which a full and true specification follows.

The invention is an improvement in the mounting of the nipper frame of cotton combers, and particularly of high speed cotton combers, such, for example, as the machine shown in Patent No. 822,479 of June 5, 1906, and known as the Whitin high speed cotton comber.

The invention resides in a yieldable mounting for such nipper frames, as herein-after more fully explained, whereby the efficiency and durability of the comber is improved and the smoothness of its running greatly enhanced.

In the type of comber referred to, the nipper-frame is mounted in a fixed position with relation to the combing cylinder and detaching mechanism, in which fixed position it receives and holds the tuft of staple while the combing and detaching half-laps of the cylinder operate upon it. The nipper-frame is rigidly fastened upon solid foundations carried by the machine frame. The oscillating nipper knife which is carried by the nipper-frame, is brought into nipping relation with the cushion plate thereof, once for every revolution of the combing cylinder, and at a speed of operation of, say, 120 to 135 nips per minute, which is a usual or normal rate. The impact of the knife upon the cushion plate produces vibration of the entire comber which, by reason of its high frequency and the pressure of the knife against the cushion plate, causes objectionable noise and is apt to cause the settling of the nipper-frame or its supporting parts, resulting in imperfect nipping of the cotton and consequent loss in efficiency, and complicates and aggravates the labor of adjustment. I have discovered that these objections can be largely overcome without altering the adjustment of the machine or disturbing or affecting the fixed relation between the nipper mechanism and the combing cylinder, by constructing the said mechanism with provisions for a slight yield to the impact of the nipper knife, which will be hereinafter more fully described, and,

further, that such provisions produce an immediate improvement in the nip upon the staple, which is made apparent by a marked reduction in the number of long fibers carried over into the waste. My present invention thus operates to remove certain existing objections as well as to improve the efficiency of the combing operation.

I am aware that a resilient or yielding nipping face, made of leather or equivalent compressible material, has already been applied to the edge of the cushion plate, for the purpose of improving the nip upon the staple, and I am also aware that nipper frames have been heretofore supported by springs, so as to be depressible by the action of the nipper knife, against the tension of the springs. Such frames swing from an upper position, occupied during the detaching of the tuft or the feeding of the lap, to a lower position wherein the projecting tuft is held against the combing cylinder and do not, therefore, occupy the fixed position, with respect to the other parts, which is essential in high speed machines. The combers in which such constructions are employed are not capable of a speed exceeding 80, or at the most 90, nips per minute, and the particular objections which the present invention overcomes, which are objections arising primarily from the high speed, were therefore not present in such combers. My invention is distinguished from such prior constructions, as will be later observed, by the principal fact that the nipper frame is at all times and permanently in one position, which is its operative position with respect to the combing cylinder and other parts, and that the provisions for yield, above referred to, are effective in absorbing shock and improving the nipping action but are not operative to permit or produce any change in the location of the nipped tuft, the yielding movement being so slight as not to disturb or affect the permanent adjustment of the parts, indeed being preferably so slight as not to be visibly appreciable when the machine is in normal operation. Several methods of providing such yielding support are described herein, and various other ways will suggest themselves to those familiar with the operation and construction of combing machines, all of which are intended to be included within the claims.

In the said drawings, Figure 1 is a side

elevation of a nipper-frame of a cotton comber together with certain of the related parts, being a view taken transversely through a portion of a Whitin cotton comber; Fig. 1^a is a detail; Fig. 2 is a similar view with the body of the nipper stand removed; Fig. 3 is a rear elevation of the nipper frame and knife of the preceding figures, showing also the inclined standard in section; Fig. 4 is a top plan of Fig. 3; and Figs. 5, 6, and 7 are modifications.

In Figs. 1 to 4, the numeral 1 represents one of the inclined frame standards which are commonly located between each of the heads of cotton combers for supporting the various parts of the operating mechanism. For sake of clearness of illustration, the inclined standard shown in the drawings is the one at the end of the series. The nipper frame (7) is supported upon this standard by one of its ends, and upon the next adjacent standard by its other end, not shown, being held in place in both cases by means of adjustable supporting parts, later described, which are reverse duplicates of each other. The combing shaft 2, also supported in the frame standard 1, carries the combing cylinder 3 which revolves directly beneath the nipper-frame in coöperative relation therewith and also with the detaching roller 4 which, with the rollers 5 and 6, constitutes the detaching and piecing mechanism of familiar operation. The nipper-frame 7, is formed of two upright end portions provided with the upright forked arms 7^a and 7^b, and united by a cross-bar or body portion 7^c (see Figs. 3 and 4), to the bottom of which body portion the cushion plate 8, shown also in dotted lines in Figs. 1 and 2, is adjustably secured. The cushion-plate being the member against which the staple is nipped by the nipper-knife, may be the usual all-metal plate or of any appropriate construction, and is adjustably secured in place by usual means, not shown. The nipper-frame also carries the fulcrum shaft 9, for the arms 10 which carry the nipper knife 11. There is one such arm 10, fulcrumed on shaft 9, at the inner side of each upright portion of the nipper frame, both arms being rigidly connected at their forward ends by the nipper-knife, in the usual manner. The rearward extremity of each arm 10 is connected for operation with a rod 12, all of which are jointly actuated by suitable lever connections with a common cam-shaft (not shown) in the usual way. The upright end piece of the nipper frame, is provided at each end with an outwardly projecting, and usually integral, gudgeon 7^a (Figs. 1 and 2) which is received in a socket bearing in the forward end of a hanger block 13, forming a pivotal support for the entire nipper frame and the parts carried by it. By means of this support the nipper-

frame is capable of angular movement for adjustment with respect to the combing cylinder and detaching mechanism. The hanger block 13 is supported upon the inner side of the upright nipper stand 14 which is planted on the inclined frame standard 1 and held rigidly in place by two bolts as shown. The hanger block 13 is vertically adjustable on the stand, by means of the traverse screw 15, and is also provided with a bolt slot registering with a corresponding slot in the stand so that it can be rigidly bolted in the adjusted position to which it has been set by the traverse screw. The registering bolt holes are shown at 16 in Fig. 1, but the bolt therefor is omitted. The upper end of the stand 14 is provided with a lateral overhanging extension 14' in which the traverse screw 15 is journaled and the said extension projects inwardly between the arms 7^a and 7^b of the nipper frame, to serve as a rigid abutment for the adjusting screws 17 and 18 which are carried by them. All of the foregoing construction is old in the machine referred to. The adjustment screws just mentioned, have hitherto been set up tightly against the opposite sides of the abutment 14' so as to hold the nipper frame and cushion-plate solidly and rigidly in a predetermined position, which position is susceptible of adjustment according to requirements, by the adjustment means just described. The provisions for the yield contemplated by this invention, I prefer to insert at this point of the adjustable mounting of the frame, though they may be usefully and efficiently employed elsewhere in the parts which constitute the support for the frame or its cushion-plate. In the embodiment of the invention shown in Figs. 1 to 4, the yield referred to is provided by a small, stiff, spiral spring, marked 23, surrounding the end of the set screw 18 so that it thrusts directly against the rear face of the abutment and the proximate face of the arm. The screw 18 when thus combined with the spring is set up to cause the spring to bear firmly against the face of the abutment, exerting considerable pressure thereagainst, while the other set screw engages the opposite side of the abutment, being held thereagainst by the action of the spring. Preferably a flanged cap 23' is interposed between the end of the screw and the spring to provide a suitable bearing for the latter thereon, as clearly shown in Fig. 1^a. There is one such spring combined with the arm 7^a and corresponding abutment, at each end of the nipper frame, so that the pressure of two springs is united to hold each frame in the angular adjustment determined by its set screws 17. The set screws 18 or their caps 23' are set up sufficiently to produce the desired spring pressure or resistance to the impact of the

nipper knife, and they may be set up to within 1/32 or 1/64 inch of actual contact with their abutments 14', if desired, so long as they do not touch the same or form a rigid or non-yielding resistance to the vibration of the frame. The force of impact of the nipper knife upon the cushion plate in normal operation is absorbed and deadened by the springs, but the nipper frames, although free to swing on their gudgeons against the springs, do not partake of any appreciable movement and their cushion plates are maintained in a position which is substantially fixed and permanent. Under abnormal conditions, such as the presence of a hard bunch of staple between the nipper members, the frame may have a more considerable movement, but in any event the operative and substantially fixed position of the cushion plate will be maintained.

The operation of the nipper mechanism does not differ otherwise from the prior construction referred to wherein the frame is solidly and non-yieldingly mounted. The feed rollers marked 19 and 20 are the usual rollers operating just above the cushion plate within the nipper frame, to advance the lap into the open nipper jaws where they are nipped by the nipper knife upon the cushion plate. The part marked 22 indicates the usual top-comb.

In the modified form of Fig. 5, the adjustment of the nipper frame on its gudgeons is accomplished in an obvious manner by means of a single screw, marked 24. This screw is adjustably held by means of screw threads and a lock nut 26, in the arm 7^b and has a reduced stem 24' which extends freely through a hole in the abutment 14' and also through a hole in the other arm 7^a, where the said stem is threaded and provided with lock nuts 25'. The shoulder formed by the parts of different diameter constitutes the bearing for the arm 7^b against the front face of the abutment, while

the nuts 25' operate to control the tension of the spring 25. The latter surrounds the stem, within the hole in arm 7^a and thrusts against the rear face of the abutment 14' and the nuts 25', and the effect of its said location is the same as that of the spring 23 above described.

In the form shown in Fig. 6, the set screws 180 and 170 correspond to the screws 18 and 17 in Fig. 1, but the former is provided with a reduced stem 30 and a washer 31 which provides the seat for the spring 230 and the latter is housed in a recess in the abutment 14'.

In Fig. 7 the adjustment screws, 17 and 18, are the same as employed in Fig. 1, but the spring 32 is a flat spring and is bolted to the end of the abutment 14' so as to form a yielding abutment for the screw, as clearly shown in the drawings. The same provisions for yield are present in this form as in the others above described. In each case the cushion plate on the nipper frame is yieldingly supported but preserved in a substantially fixed position for all of its operations.

I claim as my invention the following:

In a high speed cotton comber provided with a combing cylinder and nipper knife, a nipper-frame having means adapted to support and maintain the same substantially immovable and in a constant, fixed relation to the combing cylinder, said means including a vibration-absorbing spring sustaining the said frame against the impact of the nipper knife and normally preventing impingement of the frame, under such impact, against a rigid part of the machine.

In testimony whereof, I have signed this specification in the presence of two witnesses.

ELWIN H. ROONEY.

Witnesses:

JAS. A. YOUNG,
E. W. MEEK.