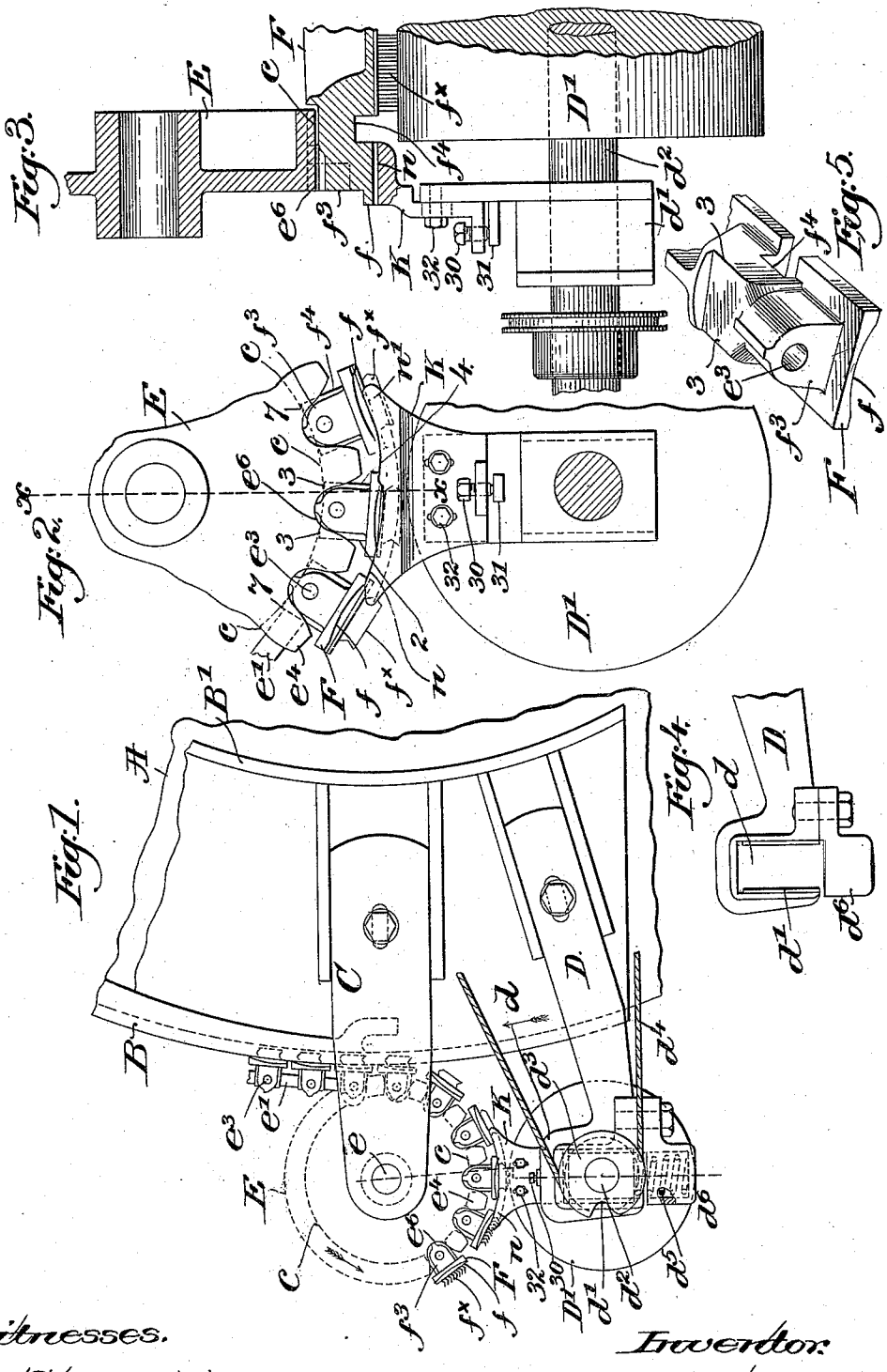
(No Model.)

J. T. MEATS.

CARD GRINDING APPARATUS.

No. 550,570. Patented Nov. 26, 1895.



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JOHN T. MEATS, OF TAUNTON, MASSACHUSETTS, ASSIGNOR TO THE MASON MACHINE WORKS, OF SAME PLACE.

CARD-GRINDING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 550,570, dated November 26, 1895.

Application filed April 3, 1894. Serial No. 506,169. (No model.)

To all whom it may concern:

Be it known that I, JOHN T. MEATS, of Taunton, county of Bristol, State of Massachusetts, have invented an Improvement in Card-Grinding Apparatus, of which the following description, in connection with the accompanying drawings, is a specification, like letters and numerals on the drawings representing like parts.

This invention has for its object the production of novel apparatus for grinding the teeth of revolving flats in use in carding-machines, said apparatus operating in novel manner, as will be described; and the particular features in which my invention consist will be hereinafter more fully described in the specification and specified in the claims at the end thereof.

Figure 1 in elevation shows a sufficient part of the main cylinder of a carding-machine and its chain of revolving flats and grinding apparatus with my improvements added to enable my invention to be understood. Fig. 2 is an enlarged detail showing part of the grinding-wheel and part of the chain-carrying wheel and some of the revolving flats in position, the chain being omitted to avoid confusion. Fig. 3 is a section in the line x, Fig. 2, looking toward the left. Fig. 4 is a detail showing part of the arm constituting a guide for the bearing which receives the journal of the grinding-wheel, and Fig. 5 shows one end of a top flat in isometric perspective.

In the drawings, A represents, let it be supposed, part of the usual card-clothed main cylinder of a carding-machine, and B part of the usual flexible bend or guide mounted on the frame B′ of the machine and along and upon which the series of revolving flats to be described travel when their teeth co-operate with the teeth of the cylinder in the carding operation. The said parts are and may be all substantially as usual, and in practice the flexible bend will have co-operating with it usual devices to determine its particular position and shape with relation to the center of the card-cylinder.

Each side frame of the machine, one being partially shown in Fig. 1, will in practice have attached to it two suitable arms C D. The arm C, which may be of any suitable shape, supports a shaft e, fast upon which at each side of the card are like wheels E, said wheels sustaining or receiving about them the usual chain e', which will be composed of links, to which are attached the pivots e^3 of the revolving flats F, to be described, thus connecting said flats into and as forming part of an endless chain. The wheels E are of peculiar construction—that is, they have a series of sprocket-teeth e^4, which extend across the wheel for a part of the width of the latter, the periphery of the wheel behind said teeth being turned to leave a cylindrical surface c (shown by dotted lines in Figs. 1 and 2 and by full lines in Fig. 3) of greater diameter than the circle occupied by the bottoms of the spaces e^6 between the teeth e^4, the cylindrical surface being cut transversely at intervals to present concavities coincident and in continuation of the bottoms of said spaces, the parts f^3 of the flats F entering the said spaces.

The flats F, the bodies of which are of usual construction and provided with usual card-clothing $f^\times$, have at their ends projections f, somewhat concaved at one side, (see Figs. 1 and 2,) said projections extending from the tooth-shaped ends f^3, which are slightly smaller than and which enter the spaces between the teeth e^4, the casting forming part of the revolving flat immediately behind the portions f^3 having other portions f^4, which present three sides 2 3 4 with substantially right-angled corners, the straight side 3 being tangent to the surface c, as represented by dotted lines in Fig. 2, there being left a small space 7, represented in Fig. 2, between the said cylindrical face c and the substantially-straight side or face 3 of the portion f^4 of the flat. In the movement of the usual chain the flats F, as their projections ride or travel along over the guide-plate K have to tip a little about their pivots e^3; but the extent to which the flats may tip is limited or restrained, so that they cannot tip too far in one or the other direction by the close proximity of the shoulders or corners at the junctions of the sides 2 3 3 4 to the cylindrical surface c referred to, the small space 7 referred to being, however, sufficient to permit the flat to tip just enough for the grinding operation.

The arm D, as herein shown, has at its outer end a notch or space d, in which is inserted a bearing or box d' for the shaft d^2 of the grinding-wheel D', said bearing being supported in a yielding manner, as by a spring d^5, said spring being sustained in a cap d^6; but any equivalent for this spring may be employed, so long as it acts to keep the bearing pressed toward the center of rotation of the wheel E in a yielding manner.

The shaft of the grinding-wheel is represented as provided with a pulley d^3, which receives a belt d^4, by which the said grinding-wheel is rotated from any usual or proper driving-shaft. The bearing or box d' for the journal of the grinding-wheel D' has also connected rigidly to it, or forming, preferably, a part of it, the guide-plate K, it having a concaved surface, over and along which the projection f of the revolving flat travels to be ground. The guide-plate K has a suitable usual bearing-surface n, (see Fig. 2,) such that when the projection of a flat comes in contact with it the grinding-roller is given a motion that carries it parallel with the surface of the points of the card-clothing of the flat being ground during its passage past said roll.

The slight tipping motion for the flat, as hereinbefore provided for, is provided in order to enable the flat or its teeth to be ground to take the proper angle and ride correctly over the guide-plate while the teeth of the flat are being ground.

It will be borne in mind that the grinding-wheel, as well as the guide-plate, is pressed in a yielding manner toward the wheel E, bringing the flats into position to be ground, and I have made the bearing-surface n of the guide-plate of such length and shape that it will not cease to act on the projection of the flat until after the grinding-wheel has finished grinding the teeth of that flat, and not until the projection of another flat next to be ground has got upon the bearing-surface of the guide-plate, and preferably not until the projection of the flat previously ground has passed from the delivery end of the working surface.

Fig. 2 shows a projection f of a top flat as having traveled sufficiently far onto the bearing-surface to enable the grinding-wheel to commence to grind the teeth of that flat, said figure also showing at the left a projection of another flat as coming onto the bearing-surface, while at the right a flat is shown as having had its teeth ground and as moving to the end of the bearing-surface. Making the projection long, so as to ride at two points upon the bearing-surface, and concaving said projection between its bearings-points, enables the flat to ride steadily on the bearing-surface without tipping during the grinding operation; but yet said flat is enabled to tip as it comes onto and as it goes off the end of the bearing-surface, the grinding-wheel not then acting on the teeth of the flat.

Fig. 1 shows the three flats next the bearing-surface as moved farther along thereon than in Fig. 2, the grinding-wheel acting on the central portion of the teeth of the middle flat.

The intervals between the card-clothing of one top flat and the next to be ground gives ample time for the grinding-roller to adjust itself to each succeeding flat, so that the projection of the flat and the face of the card-clothed surface thereof are always in a certain definite position with relation to the bearing-surface of the guide-plate during the grinding operation, thus insuring a uniform length of teeth upon the flats and the uniform operation of the teeth of each flat with relation to the teeth of the carding-cylinder; or, in other words, absolute uniformity of distance between the teeth of the flats and the teeth of the cylinder is maintained, notwithstanding any difference of wear of the projection of one flat as compared with the projection of any other flat in the same series of revolving flats. This important result in carding-machines is effected chiefly by connecting the guide-plate having the bearing-surface n fixedly to the bearing for the grinding-wheel, so that said parts move in unison, instead of one sliding on the other, as is usual in machines of this class.

In order that the acting face n of the guide-plate K may be put at the proper distance from the center of the shaft d^2, I have made the guide-plate in two parts, one part having an adjusting-screw 30, which contacts with a lug 31 on the other part, the two parts being connected by suitable set-screws 32, screwed into one part and extended through a slot in the other part. When the set-screws are turned to leave the upper part of the guide-plate loose, the adjusting-screw may be rotated, and the adjustment having been effected the set-screws will be set.

I do not claim a grinding-wheel mounted in arms or weighted levers and a guide secured to a lever pivotally mounted with relation to the lever carrying the shaft of the grinding-wheel, said lever being controlled as to its position by a spring, the inclination of said guide being changeable on or with relation to the levers or arms carrying the grinding-wheel, as provided for in United States Patent No. 473,187.

In my invention the bearing-surface upon which the projection of the flat travels and rests during the grinding operation is absolutely fixed to the bearing-support of the shaft carrying the grinding-wheel, and there is absolutely no change of position of the bearing-surface on or with relation to the bearings for the shaft carrying the grinding-wheel.

I have herein shown and described a pair of sprocket-wheels E fast on a shaft e at that side of the main cylinder at which the grinder is located, which in the present instance is at the side opposite that on which the usual chain-driving sprocket-wheels are arranged; but while the location of a pair of connected

sprockets at each side of the main cylinder is, so far as I am aware, new and advantageous, yet I do not herein claim such an arrangement, as the same forms part of the subject-matter of another application, Serial No. 531,895, pending concurrently herewith. I have also shown the revolving flats as slotted at their ends and at their under sides, as at f^4, Fig. 5; but I do not herein claim the same, as such feature is also incorporated and claimed in said other application, Serial No. 531,895, referred to.

Having described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a carding machine, a grinding roll, its bearing; and a rigidly attached concave faced bearing surface, combined with a series of top flats having guiding surfaces adapted to ride upon said bearing surface when being ground, substantially as described.

2. In a carding machine, a grinding wheel, its bearing; and a rigidly attached bearing surface, and means to support said bearing in a yielding manner, combined with a series of top flats having projections adapted to contact with said bearing surface and ride thereon during the grinding operation without tipping, substantially as described.

3. In a carding machine, a grinding wheel, a bearing therefor having an attached bearing surface concaved at its upper side, and a yielding support for said bearing, combined with a series of top flats having projections concaved to present two points to rest upon and travel along said bearing surface, said top flats being pivotally connected to and adapted to tip on or with relation to their carrying devices when coming onto and traveling off said bearing surface, substantially as described.

4. The wheel E having a toothed surface and a turned surface *c* a portion of which is cut away or notched to correspond with the bottoms of the spaces between the teeth of said wheel; and a revolving flat supported upon said turned surface and having a portion entering between the teeth of said wheel, combined with a grinding wheel mounted in a bearing having a rigidly attached guide-plate provided with a bearing surface co-operating with a working projection on said revolving flat, and with a yielding support for the bearing of the grinding surface, to operate, substantially as described.

5. In a grinding machine, a grinding wheel, a bearing for the journals thereof, and a guide plate K rigidly attached to said bearing, adjusting devices to adjust said plate on said bearing, an arm D shaped to receive and guide said bearing, and a spring to support the latter in a yielding manner, to operate, as and for the purposes described.

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

JOHN T. MEATS.

Witnesses:
T. G. COX,
JOSEPH S. EATON.