

No. 854,642.

PATENTED MAY 21, 1907.

C. E. HARPER.

FEED ROLL FOR WOOD PLANING MACHINES.

APPLICATION FILED SEPT. 10, 1906.

3 SHEETS—SHEET 1.

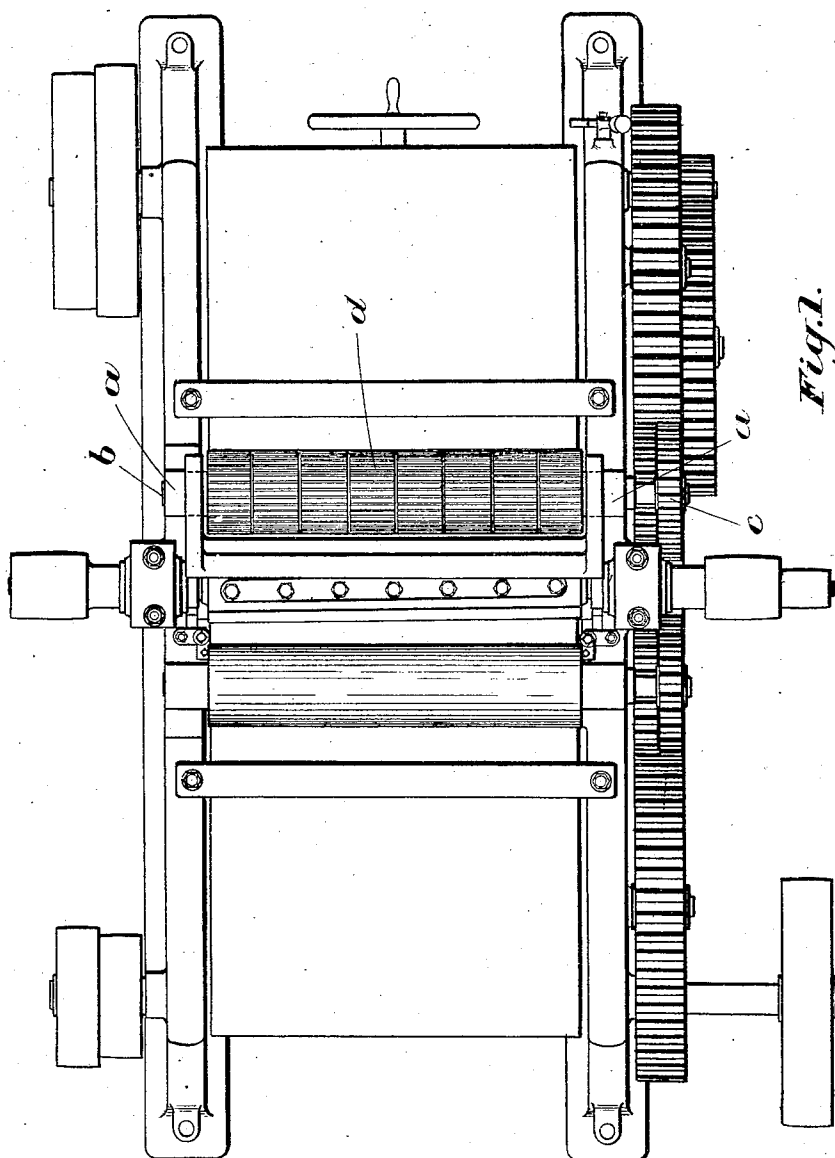


Fig. 1.

Witnesses.

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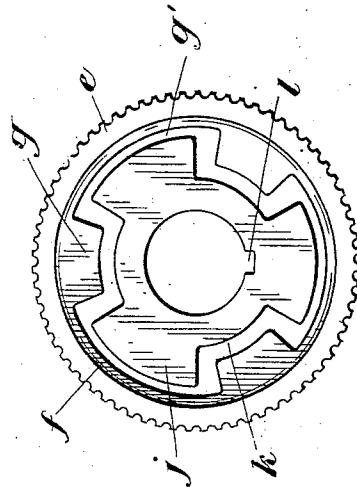
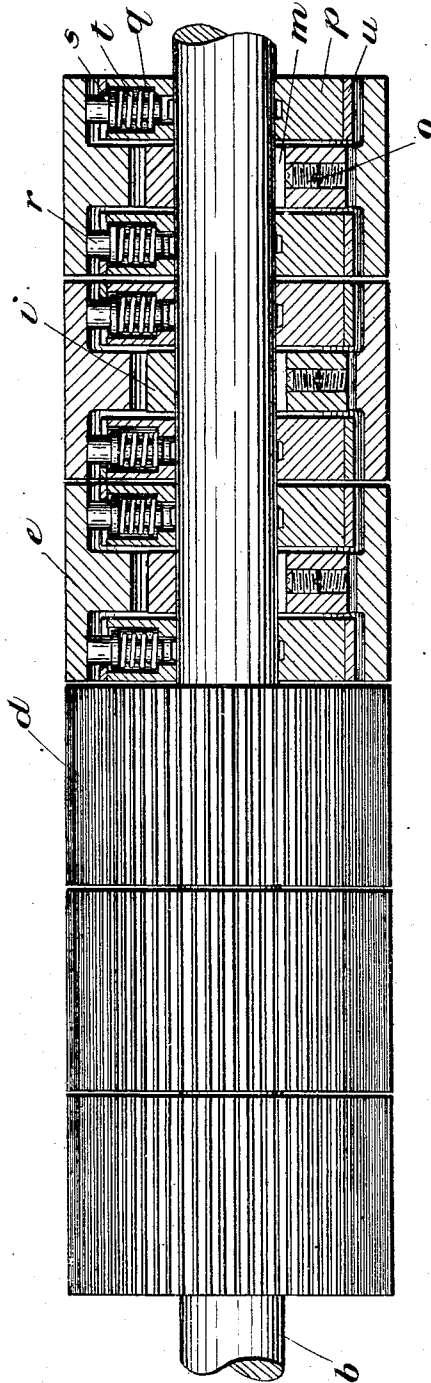


Fig. 2.

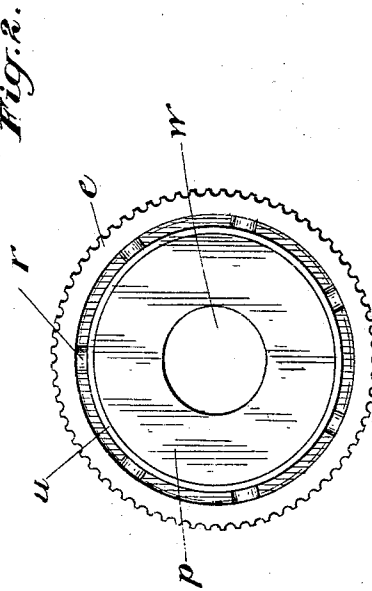


Fig. 3.

Witnesses.
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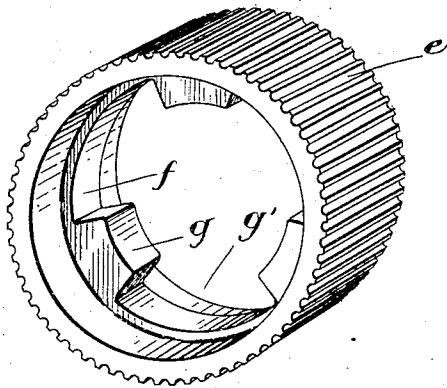


Fig. 5.

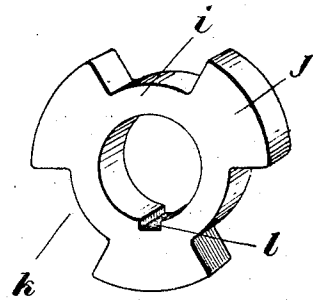


Fig. 6.

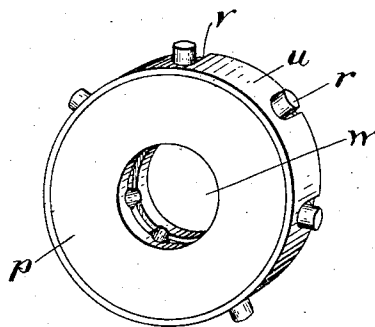


Fig. 7.

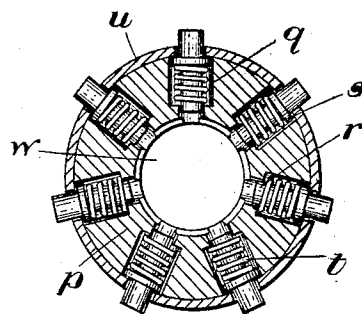


Fig. 8.

Witnesses.

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UNITED STATES PATENT OFFICE.

CHARLES ERNEST HARPER, OF WHITBY, ONTARIO, CANADA, ASSIGNOR TO
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FEED-ROLL FOR WOOD-PLANING MACHINES.

No. 854,642.

Specification of Letters Patent.

Patented May 21, 1907.

Application filed September 10, 1906. Serial No. 334,028.

To all whom it may concern:

Be it known that I, CHARLES ERNEST HARPER, of the town of Whitby, in the county of Ontario and Province of Ontario, Canada, have invented certain new and useful Improvements in Feed-Rolls for Wood-Planing Machines; and I hereby declare that the following is a full, clear, and exact description of the same.

This invention relates to certain new and useful improvements in wood planing machines, and it relates more particularly to a feed roll which will maintain a constant pressure on the boards across their entire width to evenly and continuously deliver them to the cutter heads irrespective of any reasonable variations in the thickness of the boards resulting from natural or unnatural causes.

For a full understanding of the invention reference is to be had to the following description and to the accompanying drawings in which—

Figure 1 is a plan view of a wood planing machine showing the application of the present invention. Fig. 2 is a sectional view of the feed roll showing the relative arrangement of its internal parts. Fig. 3 is a side elevation of one of the feed roll sections with the co-acting parts contained therein. Fig. 4 is a similar view to Fig. 3 with one of the pressure devices removed to show the arrangement of the clutch members. Fig. 5 is a detail view of one of the feed roll sections with the co-acting parts removed. Fig. 6 is a detail view of one of the clutch members for the feed roll shaft. Fig. 7 is a detail view of one of the pressure devices showing all of the parts assembled, and Fig. 8 is a sectional view of the construction shown in Fig. 7.

Like characters of reference refer to like parts throughout the specification and drawings.

Journalled in the usual bearing boxes *a* for the feed roll is the feed roll shaft *b* driven by the usual intermeshing gear *c* and encircling the feed roll shaft *b* between the bearing boxes *a* are a series of individual and independently acting feed roll sections *d*. Each feed roll section as shown in Fig. 5 consists of a unitary casting comprising an annular rim *e* having its outer surface fluted after the usual manner of feed rolls, an annular rib, *f*,

centrally located on the inner surface of the rim *e*, and three inwardly tapering clutch members *g* equi spaced on the circle of the rib, with outwardly tapering spaces *g'* between them.

Mounted on the feed roll shaft *b* is a clutch hub *i* from which projects three outwardly tapering clutch members *j* to enter the spaces *g'* between the clutch members *g*, and between the clutch members *j* are inwardly tapering spaces *k* to receive the clutch members *g*. The width of the spaces *g'* between the clutch members *g* is greater than the width of the clutch members *j* and the width of the spaces *k* between the clutch members *j* is correspondingly greater than the width of the clutch members *g* to provide for a limited movement of the clutch members *j* independently of the feed roll sections *d* at the commencement and termination of the revolution of the feed roll shaft, and to permit of the radial action of the feed roll sections hereinafter described.

As shown in Fig. 6 the clutch hub *i* is formed with a key seat *l* to receive the key *m* of the feed roll shaft *b* which causes the clutch hub and clutch members *j* to unitedly revolve with the feed roll shaft. To prevent the displacement of the clutch hub on the feed roll shaft, one of the clutch members is formed with a screw-threaded bore extending through the clutch hub *i* to receive a locking screw *o* so that the clutch hub can be locked to the feed roll shaft against lateral displacement thereon.

Mounted on the feed roll shaft *b* on each side of the clutch hub and wholly within the plane of the ends of the rim *e*, is a feed roll section hub *p* provided with a series of spoke seats *q*, and contained in the spoke seats *q* are the inner ends of the spokes *r*. The inner ends of the spokes *r* are of less diameter than the spoke seats *q* and the spokes within the spoke seats are provided with spoke flanges *s*. Encircling the inner ends of the spokes *r* between the flanges *s* and the bottom of the spoke seats are tension springs *t* which normally press the spokes outwardly to engage the inner surface of the rim *e*.

Encircling the feed roll section hub *p* is a locking ring *u* having spoke slots *v* registering with the spoke seats but of less width than the diameter of the flanges *s*, to engage the latter as they move outward under the influ-

ence of the springs and thus limit the outward movement of the spokes.

In assembling the parts the pressure springs and the inner ends of the spoke flanges, are pressed into the spoke seats until the flanges *s* are wholly within the plane of the perimeter of the feed roll section hub *p*. The locking ring is then positioned on the hub *p* so that the spoke slots will register with the spoke seats, and then pressed into place so that the parts of the locking ring surrounding the slots will overlap the spoke flanges and prevent their displacement beyond the perimeter of the feed roll section hub. The bore *w* of the feed roll section hub *p* is central to its perimeter, and the strength of all the springs and the length of all the spokes *r* are the same. When the parts, viz,—the rim *e*, clutch members, clutch hub, and the feed roll section hub and spring tensioned spokes are in position around the feed roll shaft, the perimeter of all the feed roll sections under normal conditions will be concentric with the perimeter of the feed roll shaft. All of the parts constituting the feed roll are made to the same templets, so that when the feed roll sections are assembled, their perimeters will be in the same curvilinear plane under normal conditions so that the distance between the work table and the feed roll can be accurately gaged.

During its revolution the feed roll shaft carries with it the clutch hub *i* and clutch members *j* of each feed roll section *d* so that the clutch members *j* will simultaneously engage with their corresponding clutch members *g* and cause the united revolution of the feed roll sections, the pressure devices causing the feed roll sections to continuously revolve in their fixed curvilinear planes while the material passing to the cutter heads does not exceed the gage for which the machine is set. Each feed roll section is of a comparatively narrow length as compared with that of the feed roll, and should any part of the material exceed the gage, at which the machine is set, the rim *e* opposite the excess will yield by compressing the lowermost spoke or spokes and the adjoining spokes to a greater or less extent as far as the horizontal diameter of the feed roll section, the yielding movement of the rim being limited only by the contact of its inner surface with the perimeter of the locking rings *u* which encircle the feed roll section hub *p*. By constructing the feed roll sections, as above described, each individual section can act independently of the other sections, and thus enable the feed roll to apply a substantially equal pressure throughout its entire length upon the material passing to the cutter head irrespective of any variation in the thickness of the material across the width thereof. By making the feed roll section hubs separate from the feed roll section rims,

and clutch hubs and yieldingly supporting the feed roll section rims from the feed roll section hubs, the feed roll sections are able to maintain a uniform pressure on the work, and the springs are compelled to press radially from the center of the shaft so that they will exert their full force on the work and be protected from injury resulting from side twisting.

It has been proved in the field of actual experience that boards vary in thickness throughout their length and width, and that in many instances a board will be considerably thicker at the middle than at the edges, and thicker along one edge than along the other, and where the feed roll is of solid or unitary character it will contact the board at the thicker part and be free from contact with it at the thinner one which not only results in an irregular and uncertain feed of the material to the cutter heads, but also retards the operation of the machine and reduces the quantity of material which it is capable of dressing. By the use of an invention of this character, a continuously even feed can be maintained as each feed roll section is of a substantially narrow character, and will yield independently of the other sections, to the increased thickness of the material passing beneath it and thus enable the other feed roll sections to maintain their normal position and apply a continuously even pressure to the material as they drive it forward.

As shown in Figs. 2 and 3, an unoccupied space exists between the inner surface of the rim *e* and the outer surface of the locking ring *u* of any selective depth to provide for the compression or movement of the rim radially in the direction of the center of the feed roll shaft while the feed roll section is operating against an increased thickness of the board.

The locking ring and the spoke flanges operate to maintain the annular alinement under normal conditions of the outer ends of the spokes so that the latter will maintain the rim under normal conditions concentric with the center of the feed roll shaft.

Having thus fully described my invention what I claim as new and desire to secure by Letters Patent is:

1. A feed roll section comprising an annular rim, clutch members projecting inwardly from the inner surface thereof, a clutch hub, clutch members forming part of the clutch hub engaging with the clutch members of the annular rim, feed roll section hubs separate from clutch hub and the rim, and a yielding means interposed between the feed roll section hubs and the rim to yieldingly hold it concentric with the center of the feed roll section hubs.

2. A feed roll section comprising an annular rim, clutch members projecting inwardly from the inner surface thereof, a clutch hub,

clutch members forming part of the clutch hub and co-acting with the first mentioned clutch members, feed roll section hubs independent from the rim arranged at the sides of the clutch hub, spring tensioned spokes carried by the feed roll section hub and engaging the inner surface of the rim.

3. A feed roll section comprising a rim, clutch members projecting inwardly from the inner surface thereof, a clutch hub, clutch members for the clutch hub co-acting with the first mentioned clutch members to cause the revolution of the rim, feed roll section hubs at the sides of the clutch hub and separated from the rim, spoke seats in the feed roll section hubs, spokes contained in the spoke seats, flanges for the spokes between their inner and outer ends, springs encircling the spokes between the flanges and the bottom of the spoke seats to normally press them into contact with the inner surface of the rim, and a retaining ring encircling the feed roll section hubs to hold the inner ends of the spokes in the spoke seats.

4. A feed roll section comprising a feed roll shaft, a series of independently acting feed roll sections encircling the shaft and separated therefrom but revoluble therewith each feed roll section comprising an annular rim, clutch members projecting inwardly from the inner surface thereof, a clutch hub for each feed roll section mounted on the shaft to revolve therewith, clutch members for each clutch hub co-acting with the clutch members of the rim to cause the latter to revolve with the feed roll shaft, feed roll section hubs loosely mounted upon the feed roll shaft and of less diameter than the rim to provide for the radial movement of the latter, spoke seats contained in the feed roll section hubs, spokes having their inner ends in the spoke seats, and springs normally pressing the spokes outwardly against the inner surface of the rim to maintain it normally concentric with the center of the feed roll shaft.

5. A feed roll section comprising a feed roll shaft, a series of independently acting feed roll sections encircling the shaft and separated therefrom but revoluble therewith, each feed roll section comprising an annular rim, clutch members projecting inwardly

from the inner surface thereof, a clutch hub for each feed roll section mounted on the shaft to revolve therewith, clutch members for each clutch hub co-acting with the clutch members of the rim to cause the latter to revolve with the feed roll shaft, feed roll section hubs loosely mounted upon the feed roll shaft and of less diameter than the rim to provide for the radial movement of the latter, spoke seats contained in the feed roll section hubs, spokes having their inner ends contained in the spoke seats, and springs normally pressing the spokes outwardly against the inner surface of the rim to maintain it normally concentric with the center of the feed roll shaft, and means to limit the outward movement of the spokes.

6. A feed roll section comprising a feed roll shaft, a series of independently acting feed roll sections encircling the shaft separated therefrom but revoluble therewith, each feed roll section comprising an annular rim, clutch members projecting inwardly from the inner surface thereof, a clutch hub for each feed roll section mounted on the shaft to revolve therewith, clutch members for each clutch hub co-acting with the clutch members of the rim to cause the latter to revolve with the feed roll shaft, feed roll section hubs loosely mounted upon the feed roll shaft and of less diameter than the rim to provide for the radial movement of the latter, spoke seats contained in the feed roll section hubs, spokes having their inner ends contained in the spoke seats, springs normally pressing the spokes outwardly against the inner surface of the rim to maintain it normally concentric with the center of the feed roll shaft, means to limit the outward movement of the spokes consisting of an annular rim encircling the feed roll section hubs having slots therein registering with the spoke seats, and flanges connected to the spokes within the circle of the annular rim to engage with the inner surface thereof.

Whitby August 22nd. 1906.

CHARLES ERNEST HARPER.

Signed in the presence of—

ARTHUR CHRISTIAN,
JNO. E. FAREWELL.