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PATENTED JAN. 9, 1906.

J. T. LECKENBY.

MACHINE FOR TRIMMING THE CORNERS OF BOXES.

APPLICATION FILED JULY 24, 1905.

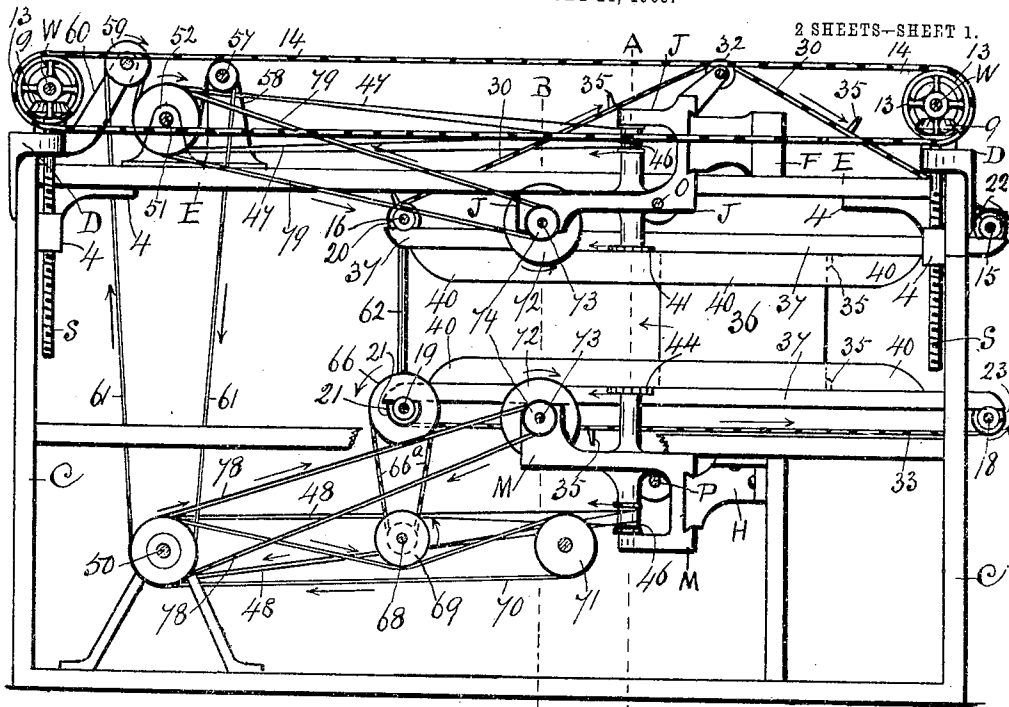


Fig. 1.

B A

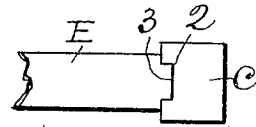


Fig. 6.

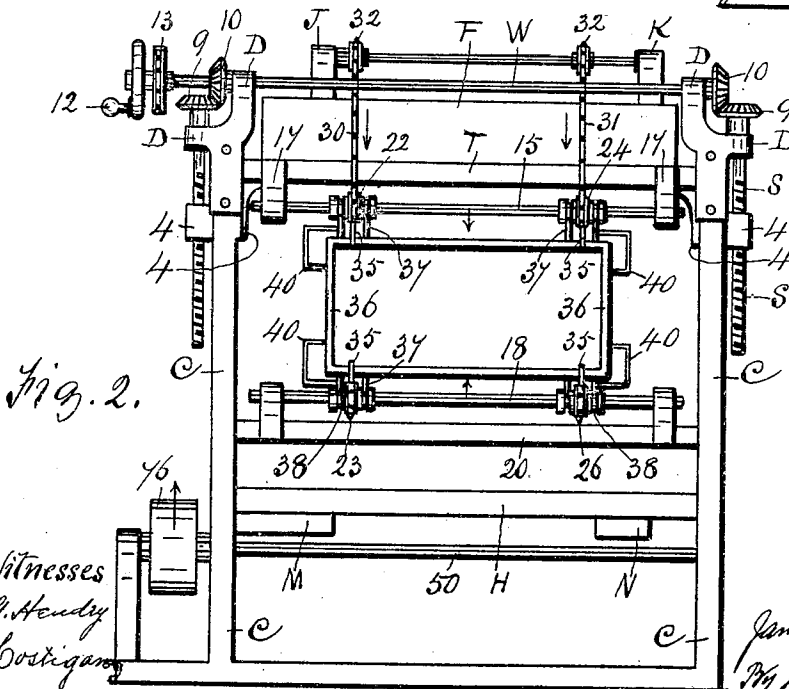


Fig. 2.

Witnesses
E. G. Hendy
J. J. Corrigan

Inventor.
James T. Leckenby
By John H. Hendy
Atty.

No. 809,308.

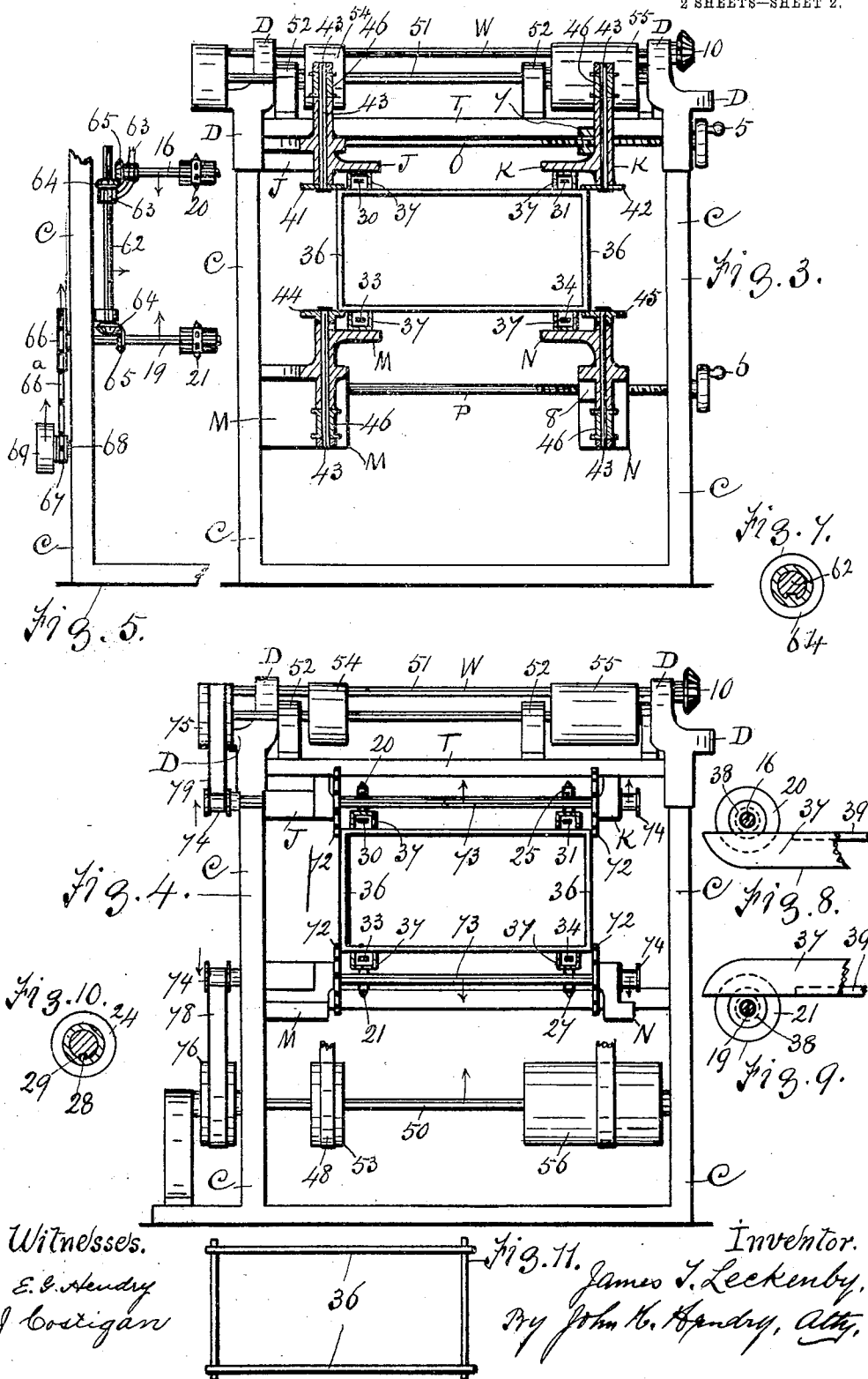
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2 SHEETS—SHEET 2.



UNITED STATES PATENT OFFICE.

JAMES T. LECKENBY, OF HAMILTON, CANADA.

MACHINE FOR TRIMMING THE CORNERS OF BOXES.

No. 809,308.

Specification of Letters Patent.

Patented Jan. 9, 1906.

Application filed July 24, 1905. Serial No. 270,939.

To all whom it may concern:

Be it known that I, JAMES T. LECKENBY, a citizen of Canada, and a resident of Hamilton, in the county of Wentworth and Province of Ontario, Canada, have invented new and useful Improvements in Machines for Trimming the Corners of Boxes, of which the following is a specification.

My invention relates to improvements in machines for trimming the corners of boxes, in which upper and lower horizontal chains on sprocket-wheels are adapted to rotate in a framework and carrying horizontally a succession of boxes between said chains, horizontal stationary supports and guides partially covering said chains and for the boxes to travel on, and stationary side guides for the boxes, means for vertically adjusting the upper chains, supports, and side guides, and means for horizontally adjusting an upper and a lower chain, support, and side guide on one side of the machine, also means for revolving of horizontal and vertical saws to saw off the corners of the boxes.

The objects of my invention are, first, to provide a machine adapted to carry the four sides of a partially-finished box through the same and at the same time to saw off the protruding corners or projecting ends of the dovetails of the box and flush with the sides of the box; second, to provide means for one box to follow another box in succession and complete the trimming of each box in one passage of the box; third, to provide means for adjusting the machine to suit various vertical dimensions of boxes, as per illustration in the drawings; fourth, to provide means for adjusting the machine to suit various horizontal dimensions of boxes, as per illustration in the drawings; fifth, to provide for horizontally supporting and guiding the passage of the boxes through the operation of trimming, and, sixth, to afford facilities for operating the several movements of the machine, as set forth. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of the machine, a central part of the lower horizontal rail broken away and the partial side coverings removed. Fig. 2 is an elevation of the machine as viewed from the right-hand end or feed end of the machine, showing the end part of a box in position to pass through the machine. Fig. 3 is an end elevation of the

machine through the vertical broken line A A of Fig. 1 of the drawings and partially in section, also showing a box in progression. Fig. 4 is an end elevation of the machine through the vertical broken line B B of Fig. 1 of the drawings, also showing a box in its progression. Figs 3 and 4 are views from the right-hand end of the machine. Fig. 5 is a detail end elevation of the means for revolving the vertical shaft, which is a means for revolving the upper endless chain above the box. Fig. 6 is an enlarged detail plan of the right-hand end of the top horizontal rail of the machine, both ends of which are similar and which with other mechanism is adapted to vertically slide in the end posts or framework of the machine. Fig. 7 is an enlarged detail sectional plan of the vertical shaft referred to, showing the hub in section of its upper bevel-wheel. Figs. 8 and 9 are enlarged and broken side elevations of the upper and lower stationary horizontal supports between which the box travels and the end parts of which are recessed into the hubs of the sprocket-wheels which carry the endless chains. Fig. 10 is an enlarged detail section of the transverse shafts, showing the section of a hub of a sprocket-chain wheel, a horizontal groove in the shaft similar to the one shown in Fig. 7 of the drawings. Fig. 11 is an end elevation of the box, showing the protruding dovetails or corners previous to passing through the machine.

Similar characters refer to similar parts throughout the several views.

In the drawings the rigid stationary framework and vertical corner-posts of the machine are indicated by C and are rigidly held together by means of a suitable base and other horizontal and transverse rails, sidings, and the like. The tops of the posts are provided with bearings D, rigidly secured thereto. The inner sides of the posts have vertical grooves 2 extending from the top to a distance downward and shown in Fig. 6 of the drawings.

E represents upper horizontal side rails which extend from post to post and have end tongues 3, which, together with the secured guides, are adapted to slide in the grooves 2. The guides 4 form a part of the rails E and strengthen the same and are rigidly secured to the rails.

F is a transverse guide secured to and forming a part of the rails E and extends

transversely from side to side of the machine, and H is a lower similar guide in vertical line with the guide F and extends transversely from side to side of the machine and
 5 rigidly secured to the rigid framework of the machine and forms a part of the rigid frame. The upper bearing J is rigidly secured to the guide F, and the opposite bearing K (shown in Figs. 3 and 4 of the drawings) is similar to
 10 the bearing J and in horizontal line therewith and is adapted to slide transversely on the transverse guide F.

M is a lower bearing in vertical line with the bearing J and similar thereto and is rigidly secured to the guide H, stationary and
 15 rigid with the framework and posts C of the machine.

N is a lower bearing in vertical line with the bearing K and similar thereto and is adapted to slide transversely on the lower rigid guide H.

O and P in Fig. 3 of the drawings are transverse threaded rods which extend from the rear side of the machine and beyond to the
 25 bearings J and M, respectively, and loosely secured thereto. The rods O and P have crank-wheel handles 5 and 6, respectively, to rotate said rods. The rods O and P pass through threaded nuts 7 and 8, respectively,
 30 confined in the bearings K and N in suitable places. This feature of moving a body by means of a threaded rod and confined nut I do not claim as new.

The bearings D, referred to, have side extensions, through which pass the vertical
 35 side screws S, which are adapted to rotate therein. The guides 4 of the adjustable rails E have side extensions with interior thread, and the screws S screw into and extend upward and below and rest on the bearings D,
 40 which support the horizontal frame, comprising the side rails E, the transverse end bars T, the guides F, the bearings J, and other mechanism connected to the guides.
 45 The screws S have bevel-wheels 9 screwed to the upper ends thereof, and the transverse shafts W in bearings D have similar bevel-wheels 10 secured thereto and which engage with and revolve the wheels 9 when the crank-
 50 handle 12 on shaft W is manipulated, as shown in Fig. 2 of the drawings. The four corners of the machine are supplied with screws S and bearings D and guides 4. On one side of the machine is the horizontal chain
 55 belt 14, on the sprocket-wheels 13, which are secured on the shafts W, and when the crank handle is revolved in either direction the screws S are revolved. Consequently the upper framework, supported on the guides 4,
 60 is vertically adjusted. Said framework is shown in the drawings almost to its highest limit of adjustment.

The upper transverse shafts 15 and 16 are supported by means of hanger-bearings 17
 65 of the upper and adjustable framework T, and

the lower transverse shafts 18 and 19 are supported by the lower rigid transverse bars 20 of the sides of the framework of the machine. The shaft 16 has a sprocket 20 secured there-
 70 to, and the shaft 19 has a sprocket 21 secured thereto, the shaft 15 has a loosely-connected sprocket 22, and the shaft 18 has a loosely-connected sprocket 23. The similar sprockets on the right-hand end part of said shafts 15, 16, 18, and 19 are adapted to slide on the
 75 shafts. The right and left hand referred to is meant as viewed in Figs. 2, 3, and 4 of the drawings. The shaft 15 referred to has a slidable sprocket 24, the shaft 16 has an opposite and slidable sprocket 25, the shaft 80 18 has a slidable sprocket 26, and the shaft 19 has an opposite slidable sprocket 27. The slidable sprockets referred to are adapted to slide in grooves a certain distance on their respective shafts. The slidable sprockets have
 85 tongues 28 (shown in Fig. 10 of the drawings) to slide in the grooves 29 in the shafts shown in the same view, Fig. 10 of the drawings. The parts of all the shafts having slidable sprockets are similar to each other, as are also the
 90 slidable sprockets. The endless chain 30 connects the sprockets 20 and 22. The endless chain 31 connects the sprockets 24 and 25. The chains 30 and 31 are similar and pass over similar idler sprockets or pulleys 32, which
 95 are journaled to the upper parts of the bearings J and K. The endless chain 33 connects the sprockets 23 and 21, and the similar endless chain 34 connects the sprockets 27 and 26. The chains carry dogs 35 at suitable
 100 distance apart and opposite to each other when traveling to engage the rear end of the box 36 and carry the same on the horizontal and stationary box-supports 37, the upper
 105 two of which are secured to the bearings J and K and the lower similar two of which are secured to the bearings M and N, respectively. The sprocket-chains 30, 31, 33, and 34 travel in channels formed between the side
 110 walls of the box-supports 37. The side hubs of the sprocket-wheels have annular grooves 38 to allow the end parts of the sides of the supports 37 to fit loosely into, in order that the sprockets may revolve.

It is absolutely necessary that the sliding
 115 sprockets have the annular grooves 38 in order that they may be moved in either direction by the end parts of the supports 37. It is not absolutely necessary for annular grooves 38 to be in the fast sprockets on the
 120 left-hand side of the machine. The lower chains 33 and 34 are supported on the horizontal body part 39 of the supports 37. (Shown broken in Fig. 9 of the drawings.) The similar body part 39 (shown in Fig. 8 of
 125 the drawings) is not absolutely necessary and only for binding the sides 37 together. Neither is it absolutely necessary that the two sides of the supports 37 shall enter the
 130 two annular grooves of the sprockets. One

said side 37 and one said annular groove would be sufficient for the supports 37 to move the slidable sprockets.

40 represents horizontal side guides to guide the sides of the box 36 and form a part of the supports 37.

41 and 42 are upper horizontal saws secured on the lower ends of the vertical shafts 43 in the bearings J and K and adapted to trim the upper protruding corners of the box shown in Fig. 11 of the drawings. 44 and 45 are similar horizontal saws secured on the tops of similar vertical shafts 43, supported in the lower bearings M and N, and are adapted to trim the lower protruding corners of the box. Each shaft 43 has a similar pulley 46 secured thereto and which are revolved in an opposite direction to the box by means of upper cross-belts 47 and lower cross-belts 48, respectively, and hereinafter mentioned.

50 is the main transverse driving-shaft of the machine and is revolved by power applied to a convenient part thereof. 51 is an upper similar transverse shaft supported in bearings 52 on the upper and vertically-adjustable framework E and T of the machine. The main shaft 50 has a fast pulley 53, (shown in Fig. 4 of the drawings,) and which revolves the pulley 46 by means of the cross-belts 48. 54 is a fast pulley on the upper shaft 51 and is similar to the lower said pulley 53. The long pulley 55 on the shaft 52 is similar to the long pulley 56 on the main shaft 50. The pulleys 55 and 56 are long for the purpose of driving the pulleys 46 on the right-hand side of the machine when the right-hand bearings K and N are horizontally adjusted by means of the cranks 5 and 6. The pulleys 53, 54, 55, and 56 are all for the purpose of revolving the pulleys 46, which revolve the horizontal saws referred to.

In the upper part of Fig. 1 of the drawings is shown an idler-pulley 57, journaled to a bearing 58, which is secured to the adjustable upper frame.

59 is an idler-pulley journaled to a bearing 60, which is a part of the rigid bearing D and remains stationary therewith. A belt 61, the pulleys 56 and 55, or similar pulley on the shafts 50 and 51 and passes over the idler-pulleys 57 and 59.

The idler-pulleys referred to allow the adjustment of the upper frame by means of the crank 12 and screws S, referred to. If the belt 61 were direct from shaft 50 to shaft 51, then the belt would be inoperative.

A vertical shaft 62 is shown in Figs. 1 and 5 of the drawings. The lower part is journaled to the rigid frame and the upper part is journaled to the adjustable frame, and the upper bearing 63 is connected with the transverse shaft 16 and with the adjustable frame. The shaft 62 has an upper bevel-wheel 64 and a lower similar wheel 64, which revolve

the similar wheels 65, secured on the shafts 16 and 19. The upper wheel 64 is adapted to slide on the vertically-slotted shaft 62. (Shown in Fig. 7 of the drawings and identical with Fig. 10 of the drawings.) The shaft 19 has a sprocket 66 revolved by the sprocket 67 on a rigid stud 68 of the rigid frame of the machine. A chain 66^a connects the two sprockets. The pulley 69 is a part of the sprocket 67 and is revolved by means of the belt 70, which also revolves the idler-pulley 71, journaled to the frame. The belt 70 is revolved by a pulley on the main shaft 50 and revolves the pulley 69 in an opposite direction to the shaft 50. The four vertical saws 72 (shown in Figs. 1 and 4 of the drawings) are similar and similarly revolved in an opposite direction to the travel of the box 36 and are secured on their respective shafts 73, adapted to revolve in the upper adjustable bearings J and K and in the similar lower bearings M and N. The right-hand end parts of the shafts 73 have horizontal slots. (Shown similar to those shown in Figs. 7 and 10 of the drawings.) The shafts 73 have similar pulleys 74 secured thereto. The said upper pulleys 74 are revolved by the pulleys 75 and 55, respectively, on the shaft 51. The lower similar pulley 74 on the shaft 73 is revolved by the pulleys 76 and 56 on the shaft 50 and by means of similar upper and lower belts 78 and 79, respectively. The upper horizontal and vertical saws are operated in a similar manner to the lower horizontal and vertical saws.

The operation of the machine is as follows: A box 36 to be trimmed is placed on the lower horizontal guide-supports 37. Then the upper similar guide-supports 37 are brought downward to proximity with the upper side of the box, together with the upper and adjustable part of the machine, by means of the crank-handle 12 revolving the vertical screws S, which engage with and lower the guides 4, together with the upper part of the machine supported by said guides. At the same time the bearings J and K of the upper part of the machine descend, together with the transverse shafts 15 and 16 and the upper saw-shaft 73, to bring the upper horizontal saws referred to in proximity to the box 36. In order to adjust the right-hand side of the machine, the crank-handles 5 and 6 are revolved by hand and the bearings K and N are moved in either direction by means of the transverse screws O and P, and when said bearings K and N are moved the horizontal saws 42 and 45, together with the right-hand side vertical saws, are also moved. All the saws revolve in an opposite direction to the box 36.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a machine for trimming the corners of boxes, a rigid frame, an upper frame adapt-

ed to vertically slide in the rigid frame, an upper transverse guide secured to the slidable frame and a similar guide secured to the rigid frame and below the upper guide, upper and lower bearings secured to said guides, and in vertical line, similar upper and lower bearings adapted to slide on the upper and lower guides, and in vertical line, means on the rigid frame and on the adjustable frame to vertically adjust the adjustable frame, means on the rigid frame and on the adjustable frame to horizontally adjust said adjustable bearings, and box-corner-trimming means.

2. In a machine for trimming the corners of boxes, a rigid frame, corner-posts in the frame, bearings secured to the upper parts of the posts, vertical grooves on the inner sides of the posts, an adjustable frame, guides secured to the frame-tongues on the guides adapted to slide in the grooves, transverse shafts journaled in bearings of the rigid frame, bevel-wheels secured on the outer ends of the shafts, sprocket-wheels on the shafts, a chain connecting the sprockets, vertical screws through said bearings and guides, bevel-wheels on the screws meshing in the bevel-wheels on the shafts, a crank-handle on one said shaft to adjust the adjustable frame, and box-corner-trimming means.

3. In a machine for trimming the corners of boxes, a rigid frame, an adjustable frame in said rigid frame, a transverse guide secured to the adjustable frame, bearing secured to the guide, a similar bearing adapted to slide on the guide, a vertical shaft adapted to revolve in the stationary bearing, a similar shaft adapted to revolve in the slidable bearing, a pulley on each shaft, a horizontal saw secured on the lower end of each shaft, means on the adjustable frame to revolve said pulleys, transverse shafts extending through said bearings, and adapted to revolve therein, a pulley on each shaft, vertical saws a part on each said shaft, and means for revolving the shafts.

4. In a machine for trimming the corners of boxes, a rigid frame, an upper frame adapted for vertical adjustment therein, transverse guides secured to each said frame, and in vertical line, stationary bearings secured to said guides and in vertical line, adjustable bearings on the guides and opposite to the stationary bearings, means connected to the rigid frame and to the adjustable bearings for adjusting the adjustable bearings, a vertical shaft in each said bearing, a pulley on each shaft, a horizontal saw on the end of each shaft and vertically opposite to each other, an upper and a lower horizontal shaft

extending through the respective upper and lower bearings, a pulley on each of said horizontal shafts and a vertical saw secured on each of said horizontal shafts.

5. In a machine for trimming the corners of boxes, a rigid frame, a frame adapted for vertical adjustment in the rigid frame, upper and lower transverse guides secured to said frames, bearings rigid on said guides, similar bearings adapted to slide on the guides, opposite horizontal saws and opposite vertical saws adapted to revolve and supported by said bearings, upper and lower chain-supports, sprockets supported on the adjustable frame, lower and vertically-opposite sprockets supported by the rigid frame, feed-chains connecting the upper sprockets and feed-chains connecting the lower sprockets, dogs on the feed-chains, supports on the adjustable frame for the feed-chains and supports on the rigid frame for the feed-chains and boxes.

6. In a machine for trimming the corners of boxes, a rigid frame, an adjustable frame to vertically slide therein, stationary bearings supported by said frames, adjustable bearings supported by said frames, horizontal chain-supports secured on said bearings, transverse shafts supported by said frames and apart from each other and in vertical line, sprockets on said shafts, horizontal chains connecting the upper sprockets, and horizontal chains connecting the lower sprockets, and in said horizontal supports, dogs on the chains, side box-guides on the chain-supports, means for adjusting the frame, means for adjusting the bearings, means for revolving the sprockets, and box-corner-trimming means.

7. In a machine for trimming the corners of boxes, a rigid frame, an adjustable frame adapted to vertical adjustment therein, means to adjust the frame, a bearing secured to one side of the adjustable frame and a similar bearing on the adjustable frame and adapted to horizontal adjustment, a vertical shaft adapted to revolve in each bearing, a pulley on each shaft, a horizontal saw on the lower end of each shaft, means on the adjustable frame for revolving the shafts, a transverse shaft extending through the bearings, a pulley on each shaft, a vertical saw secured to one end part of the horizontal shaft, a similar saw on the opposite end part of the shaft and adapted to slide thereon, and means for adjusting the saw.

JAMES T. LECKENBY.

Witnesses:

JOHN H. HENDRY,
F. J. LECKENBY.