MACHINE FOR FINISHING FLOORING.

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To all whom it may concern:

Be it known that I, ELMER C. DITTMAR, a citizen of the United States, residing at Williamsport, in the county of Lycoming and State of Pennsylvania, have invented certain new and useful Improvement in Machines for Finishing Flooring, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to means for finishing flooring, and is an improvement on the machine shown in my Patent No. 1,339,106, dated May 4, 1920, the object being to improve the general construction of the machine.

Another object of the invention is to provide a machine by means of which the flooring strip can be run through the machine on edge whereby the speed is increased and the filler is applied in such a manner that it is carried into the pores of the wood.

Another and further object of the invention is to provide a novel form of receptacle for applying the filler to the face of the strip as it passes by the same.

Another and further object of the invention is to provide novel means for guiding and driving the strip through the machine, the driving means being under the control of the operator whereby the driving rollers can be moved into contact with the strip or out of contact therewith in order to stop the movement of the strip at any time.

A still further object of the invention is to provide novel means for burnishing or scraping the surplus filler from the face of the strip.

A still further object of the invention is to provide a circular wiper having radially extending wiping strips which are adapted to force the filler into the pores of the wood and to clean the film or filler from the face of the strip before it leaves the machine.

Other and further objects and advantages of the invention will be hereinafter set forth and the novel features thereof defined by the appended claims.

In the drawings—

Figure 1 is a side elevation of the machine constructed in accordance with my invention.

Fig. 2 is a top plan view of a portion of the delivery end of the machine.

Fig. 3 is a top plan view of a portion of the feed end of the machine.

Fig. 4 is an enlarged section taken on the line 4—4 of Fig. 1.

Fig. 5 is an enlarged vertical section taken on the line 5—5 of Fig. 3.

Fig. 6 is an enlarged vertical section taken on the line 6—6 of Fig. 2.

Fig. 7 is an enlarged rear elevation of the filling receptacle, showing the same in position on the machine.

Fig. 8 is a horizontal section through the filling receptacle, showing the position of the strip of flooring in respect to the same.

Fig. 9 is a vertical section taken on the line 9—9 of Fig. 8.

Fig. 10 is a detailed perspective view of one of the guides forming the guideway for the strip.

Fig. 11 is a detailed horizontal section through a slightly modified form of pressure strip for holding the filler in the receptacle as the strip passes through the same.

In carrying out my invention I employ a frame 1 provided with a top 2 consisting of parallel bars connected together by transverse bars. Supported upon the top is a pair of guides 3 and 4, forming a guideway for the strip of flooring in its passage through the machine, said guideway having a guide member 5 at one end for guiding the strip into the guideway. The guides 3 and 4 are provided with edges conforming to the shape of the strip of flooring to be operated on, and as herein shown the upper guide 3 is provided with a substantially V-shaped groove, and the lower guide with a substantially V-shaped tongue which is notched, as shown in Fig. 10, to provide clearing spaces 6, whereby any shavings or filler which adhere to the strip will be removed so as to facilitate the travel of the strip of flooring in its passage through the machine.

In order to provide means for feeding the strips through the machine continuously, I provide a pair of steel feed rollers 7 and 8 which are mounted on shafts 9 and 10 journaled in arms 11 and 12 which are pivotally mounted on a pair of vertically disposed
The shafts 13 and 14 are journaled in suitable bearings 15 and 16 carried by a pair of crossbars 17 and 18, as clearly shown in Fig. 5. The shafts 13 and 14 are provided with meshing gears 19 and 20 which are engaged by gears 21 and 22 carried by the shafts 9 and 10, whereby the feed rollers 7 and 8 will be revolved when the shafts 13 and 14 are rotated. The shaft 14 has a depending lower end which carries a bevel gear 23 meshing with a bevel pinion 24 fixed on a driven shaft 25 which is provided with pulleys 26 and 27, over one of which is adapted to pass a drive belt 28 which is carried by a pulley 29 carried by a drive shaft 30 which is provided with spaced pulleys 31 and 32. The pulley 31 carries a belt 33 extending over the drive pulley of a motor 34 which is herein shown as an electric motor.

It is to be understood, however, that I do not limit myself to any particular form of power to drive the machine.

From the construction thus far described, when the motor is started through the driving belts, the shaft 25 will be rotated through the medium of the gears, the feed rollers will be rotated so as to cause the flooring strip to move longitudinally through the machine.

The arms 11 and 12 are connected by links 35 and 36 to a double crank 37 fixed on a rock shaft 38 mounted in suitable bearings, said shaft being provided with an arm 39 carrying an adjustable weight 40, whereby the feed rollers will be held in contact with the opposite faces of the strip under pressure. By adjusting the weight 40 on the arm 39 the pressure can be adjusted, and in order to provide means for operating the arm 39 so as to move the feed rollers out of contact with the flooring strip, I pivotally mount a lever 41 on the frame of the machine which is provided with an angle end 42 connected to the arm 39 by a link 43, and when the lever is swung on its pivot the arm will be raised so as to cause the shaft 38 to be rocked, and through the medium of the links 35 and 36 the arms 11 and 12 will be swung on their pivots so as to move the feed rollers away from one another and out of contact with the opposite faces of the flooring strip.

Lever 41 is provided with a detent 44 cooperating with a rack 45 for holding the lever in its adjusted position, and as the lever is raised adjacent the feed end of the machine, the operator can stop the feeding of the flooring strip at any time so that in case the flooring strip should jam within the machine, the movement of the same could be stopped in order to prevent injury to the parts of the machine.

The bearings 16 for the shafts 13 and 14 are extended above the top bar 18, as clearly shown in Fig. 5, and have sleeve portions 46 on which are adjustably mounted split collars 47 and 48 carrying adjustable arms 49 and 50 provided with bearings 51 in which are mounted shafts 52 and 53. Fixed on the upper ends of the shafts 52 and 53 are circular brushes 54 and 55 which are adapted to engage the opposite faces of the strip in its passage through the same for cleaning the strip before it reaches the filling device, as will be hereinafter fully described.

The shafts 52 and 53 are provided with pulleys 56 and 57 at their lower ends, over which pass drive belts 58 and 59 carried by pulleys 60 and 61 fixed on the shafts 13 and 14, whereby the brushes will be rotated. By having the arms 49 and 50 and the guides 54 and 55 adjustably mounted on the extensions of the collars 47 and 48 the position of the brushes in respect to the faces of the flooring strip can be adjusted, and by the construction herein shown I provide two adjustments, one through the medium of the collars and the other through the medium of the arms, which enables me to adjust the brushes so as to apply the proper pressure against the face of the strip in its passage therethrough, whereby the strip will be thoroughly cleaned.

The guides 3 and 4, forming the guide-way for the flooring strip, are cut away in advance of the brushes, and secured to the ends of the guides 3 and 4 at this point are the flanged portions 62 of a filler receptacle 63. The flange portion 62 of the filler receptacle 63 carries bolts 64 and 65 for securing the flange rigidly to the free ends of the guides 3 and 4 which are preferably rounded as shown at 66, so as to prevent the flooring strip from striking a sharp corner of either of the guides in its passage over the filler receptacle. In the space between the ends of the guide strips are slidably mounted guides 67 and 68, the guide 67 having a V-shaped tongue and the guide 68 a V-shaped groove so as to engage the opposite edges of the flooring, the edges of these guides corresponding in shape to the edges of the guides 3 and 4. It is to be understood, of course, that when another shape of flooring is to be finished, the guide edges of the fixed guides and the movable guides will be shaped to correspond with the tongue and groove of the flooring to be finished. The movable guides 67 and 68 carry springs 69, the free ends of which are engaged by thumb screws 70, so that the desired pressure can be exerted against the flooring strip in its passage between the movable guides, the above construction being clearly shown in Fig. 7 of the drawings, wherein the strip of flooring is shown passing between the movable guides.

Arranged opposite the filler receptacle is a backing plate A which is secured to the filler receptacle by bolts B and is provided
with cut-away portions C and rounded edges, as clearly shown in Fig. 8, the cut-away portions forming openings to receive the ends of the pressure bar.

The filler receptacle 63 is substantially cylindrical in shape and is provided with an outlet 71 extending through the flange portion through which the filler passes so as to be applied to the face of the strip in its passage by the opening.

The adjustable guides, through the spring tension means, prevent the filler from escaping from the upper and lower edges of the strip in its passage by the discharge opening of the filler receptacle. In order to provide means for preventing the filler from escaping lengthwise of the strip in its passage by the discharge opening, I provide the filler receptacle with a guideway 73 upon each side in which is slidably mounted a block 78, said block being preferably formed of wood so that the end of the block which is notched, as shown at 74, will embrace the strip, and by forming the blocks of wood with the grain running lengthwise, I have found that the life of the block is greatly increased, and means is provided whereby the filler will be prevented from escaping. One of the blocks 73 is adjustably mounted within its guideway by thumb bolts 75 which can be set so as to hold the block in contact with the face of the strip under the desired pressure and the other block at the delivery side of the filler receptacle is adjusted within its guideway by screw 76 which carries a pulley 77 at its free end over which is wound a chain 78 carrying a weight 79 where by the block will be held in contact with the face of the strip under tension so as to allow the same to yield. The ends of the block 73 are provided with beveled contact faces, as shown in Fig. 8.

In using the filler receptacle as shown, I have found that in some cases good results can be obtained by providing the contacting face of the block 73 with a backing 78, as shown in the slightly modified form in Fig. 11.

The guideways 72 are provided with detachable guide members 72 held in position by pins 72, which provides means for allowing the blocks to be removed and repaired if necessary, without removing the filler receptacle from the guideway of the machine.

The filler receptacle is provided with a feed hopper 80 and a pivoted bottom 81, locked in its adjusted position by thumb bolt 82 whereby the bottom can be swung from under the receptacle to allow the same to be cleaned. The bottom 81 is formed hollow and is provided with an inlet 83 and an outlet 84, to which steam inlet and outlet flexible pipes 85 and 86 are adapted to be connected, whereby the filler which is in a semi-plastic state in the receptacle can be heated so as to cause the same to flow freely.

In order to provide means for agitating the filler within the receptacle, I provide a revolving agitator 87 carried by a shaft 88 supported in a bearing 89 which is provided with an arm 90 fixed on an adjustable standard 91 whereby the standard can be lifted vertically so as to remove the agitator from the receptacle. The shaft 88 carries a pulley 92 over which extends drive belt 93 carried by a pulley 94 fixed on the upwardly extending portion of the shaft 14 whereby the agitator will be rotated within the receptacle.

Secured to the steel guides 3 and 4 is a housing 95 in which are mounted a plurality of rollers 96 which are adapted to engage one face of the strip of flooring, as shown in Fig. 2, so as to prevent the strip from yielding when pressure is applied to the face to be finished.

Extending from the opposite side of the guides 3 and 4 are bolts 97 carrying a housing 98 in which are mounted a plurality of bolts 99 carrying spaced collars 100, the opposing faces of which are provided with tangentially arranged grooves in which are secured strips of wood 101 and 102, which are clamped between the collars by nuts 103 mounted on the bolts 99, and as the housing 98 is adjustably mounted on the bolts 97 by winged nuts 104, the strips can be adjusted in respect to the face of the flooring strip. These strips form scrapers or burnishers and are preferably formed of end wood so that the face of the strip which has been coated with a filler is engaged by the free ends of the strips 101 in the passage of the strip through the machine. These strips have a tendency to force the filler into the pores of the wood to remove any surplus filler, as well as to smooth the strip.

The frame of the machine is provided with a transversely arranged guideway 105 in which is mounted a carriage 106 operated by a screw 107 through the medium of a hand wheel 108, whereby the carriage can be adjusted within the guideway. The carriage 106 carries standard 109 provided with a bearing 110 through which extends a shaft, not shown. Shaft 111 is provided with a pulley 112 over which passes a belt 113 extending over the pulley 32 carried by the shaft 30 whereby the shaft 111 will be revolved. The end of the shaft 111 carries a circular disk 114 on the face of which are arranged a plurality of radially extending strips of leather 115 forming a wiper or cleaner which is adapted to engage the face of the flooring strip and wipe into the pores and remove the filler as the strip of flooring passes by the same.
construction, as the revolving wiper is rotated, the strip is first wiped transversely in one direction and then transversely in another direction, and as the wipers are revolving at a high rate of speed the strip is subjected to the action of the leather fins in such a manner that the filler which has not been wiped into the pores is removed from the face of the strip so that when the strip leaves the machine it is in a condition to be varnished.

The feed rollers 7 and 8 are engaged by spring scrapers 116 so as to keep the contacting faces clean. It is of course understood that this is not essential, but I have found in practice that it is advantageous.

In the operation of the machine, a strip of flooring is forced in the guide 5 between the guideway formed by the steel guides 3 and 4, until the end of the strip of flooring is engaged by the opposing feed rollers. The strip is then fed forward through the guide way, and as it passes the rotary brushes the pores of the wood are thoroughly cleaned.

The strip then passes by the filling device and as the filler is in a semi-plastic state and is being agitated the filler is forced under pressure against the face of the strip and into the pores thereof. As the strip advances it passes by the burnishers or scrapers which remove the surplus filler from the strip of flooring. As the strip is moving continuously it passes the rotary wiper which is composed of leather fins which wipe the filler transversely of the grain so as to carry the filler into the pores of the wood and to remove any surplus filler therefrom. By having the feed rollers at the feed end of the machine a strip of flooring in its passage through the machine stops after it passes the feed rollers so that it is necessary to force another strip into the machine before the strip being filled passes by the filling device, whereby it is impossible to move a strip out of position in respect to the filling device whereby the filler is held within the receptacle at all times without any danger of leakage.

In the specification I have described the operation of the apparatus in finishing flooring, but it is of course to be understood that the apparatus is capable of operating upon strips of lumber of any kind, such as wainscoting and molding, and I do not wish to limit myself to the particular form of strip.

In the drawings I have shown an apparatus for finishing one face of the strip of lumber in its passage through the machine, but it is of course understood that the filler receptacle, brushes, burnishers and wipers could be duplicated so that both faces of the strip of lumber in its passage through the machine would be finished without departing from the spirit of my invention, as I am aware that wainscoting and the like is sometimes finished upon both sides; therefore I do not wish to limit myself to the finishing of one face of a strip of lumber.

What I claim is:

1. An apparatus for finishing flooring, comprising a guideway for supporting and guiding a strip of flooring on edge, means for moving a strip continuously in said guideway, means for applying filler to the face of the strip in its passage through said guideway, means for scraping and means for wiping the surplus filler from the face of said strip.

2. An apparatus for finishing flooring, comprising a guideway for supporting and guiding a strip of flooring on edge, a pair of movably mounted feed rollers capable of being swung into contact with the opposite faces of said strip for moving said strip continuously, means for applying filler to the face of the strip, a series of strips of wood arranged to engage the face of the strip upon which the filler has been applied, and a revolving wiper arranged to engage the face of said strip for removing the film of filler therefrom.

3. An apparatus for finishing flooring, comprising a guideway for supporting and guiding a strip of flooring on edge, means for moving strips continuously through said guideway, a pair of revolving brushes to engage the opposite faces of said strip in its passage through said guideway, a filler tank having a discharge opening, over which is adapted to pass a strip of flooring, means for scraping the filler from the strip, and means for wiping the filler from the face of the strip after it has passed said scraping means.

4. An apparatus for finishing flooring, comprising a frame having a pair of guides mounted thereon to produce a guideway, said guides being cut away, a pair of movably mounted guides working in the cut-away portions of said guides, a receptacle having a discharge opening in alignment with the cut-away portions of said guides, said receptacle having pressure bars arranged to each side of the discharge opening thereof adapted to contact with the face of said strip to each side of said discharge opening, and means for holding said pressure bars in contact with said strip.

5. An apparatus for finishing flooring having means for propelling and guiding a strip of flooring in its passage thereethrough, a receptacle having a discharge opening arranged to apply a fluid to the face of said strip in its passage through said guideway, movably mounted pressure bars carried by said receptacle contacting with the face of said strip, and means for adjusting the pressure of said bars against the face of said strip.

6. An apparatus for finishing flooring,
comprising a guideway for supporting and guiding a strip on edge, means for cleaning the strip in its passage therethrough, means for continuously moving the strip in said guideway, means for applying filler to one face of said strip under pressure, means for scraping the filler thus applied, and means for wiping the strip before it is discharged from said machine.

7. An apparatus for finishing strips of lumber, having means for supporting and continuously moving strips of lumber, means for cleaning said strips in their passage through said machine, means for applying a filler to one face of said strip, means for moving said feed rollers into and out of contact with the strip, and means for applying filler to one face of said strip after it has been cleaned, a series of scrapers arranged to engage the face of said strip after the filler has been applied thereto, and a revolving wiper having radially extending fins adapted to wipe the face of said strip transversely for wiping the filler into the pores and removing the surplus therefrom.

13. A machine for finishing flooring, comprising a frame having a guideway for supporting and guiding a strip of flooring on edge, a pair of feed rollers for moving said strip through said guideway, a pair of revolving brushes adjustable mounted to engage the opposite faces of said strip, a receptacle having a discharge opening over which the strip is adapted to pass in its passage through the said guideway, means contacting with the face of said strip and the edges thereof for preventing the filler from escaping around the discharge opening of said receptacle and a series of scrapers arranged to engage said strip.

14. A machine for finishing flooring, having means for supporting and continuously moving a strip of flooring on edge, a filler receptacle having a discharge opening over which said strip is adapted to pass, and means carried by said receptacle for preventing the escape of liquid therefrom around the discharge opening thereof, said means comprising a pair of pressure bars having means for holding the edges of said bars in contact with said strip under pressure.

15. An apparatus for finishing flooring, comprising means for supporting and continuously moving a strip of flooring on edge, a receptacle having a discharge opening over which said strip is adapted to pass, an agitator arranged within said receptacle, and movable members arranged around the discharge opening of said receptacle for preventing the escape of fluid around said discharge opening.

16. An apparatus for finishing flooring, having a receptacle provided with a discharge opening over which is adapted to be passed a strip to be finished, said receptacle having a movable support provided with a steam chamber, and movable members arranged around the discharge opening of said receptacle for preventing the escape of fluid around said opening.

17. An apparatus for finishing flooring, having a receptacle provided with a discharge opening over which is adapted to be moved a strip of flooring, movable guide members for guiding said strip of flooring over said opening, a pair of pressure bars movably mounted on said receptacle adapted to engage the face of said strip of flooring, and means for yieldably holding one of said pressure bars in contact with the face of said strip of flooring.
18. An apparatus for finishing flooring comprising a pair of guide members for supporting a strip of flooring on edge, said guide members being cut away, a receptacle arranged at the cut-away portion of the guide members having a discharge opening in alignment therewith, a pair of movable guide members arranged above and below the discharge opening of said receptacle, means for adjusting the pressure of said movable guide members, a pair of notched pressure bars slidably mounted on said receptacle at each side of the discharge opening thereof, and means for holding said pressure bars in contact with the face of said strip.

19. A liquid applying receptacle for machines of the kind described, comprising a cylindrical receptacle having a discharge opening to one side thereof, said receptacle having a movably mounted support provided with a steam chest, and means carried by said receptacle for engaging the upper and lower edges of said strip and the face of said strip to each side of the opening thereof for preventing the escape of liquid around the discharge opening of said receptacle.

20. A machine of the kind described, having a receptacle for applying liquid to a strip in its passage through the same provided with movably mounted guide members for guiding the strip, and movably mounted pressure bars for engaging the face of the strip to each side of the discharge opening of said receptacle.

21. An apparatus for finishing strips of flooring having means for supporting on edge and for continuously moving strips of flooring in their passage therethrough, means for first brushing the faces of said strips, and means for then applying filler to the face of the strip under pressure and then wiping and removing the surplus filler from the face of said strips.

22. A machine for finishing flooring, having means for moving the strip continuously in its passage therethrough, means for brushing the opposite faces of said strip, means for applying filler to one face of the strip, a series of strips of end wood arranged to engage the face of said strip on which the filler has been applied, and means for wiping said strip crosswise of the grain.

23. A machine of the kind described, having a frame provided with a drive shaft, a motor for driving said shaft, means for guiding a strip of lumber on edge in its passage through said machine, a pair of movably mounted feed rollers driven through the medium of belt and gearing for continuously moving said strip, a pair of rotary brushes arranged to engage the opposite faces of said strip, a receptacle having a discharge opening over which said strip is adapted to pass, a series of end wood scrapers arranged to engage the face of said strip, and a revolving wiper driven from said driven shaft for wiping the face of said strip crosswise of the grain thereof.

24. A machine for finishing flooring, comprising a frame having a pair of superposed guides provided with guide edges forming in shape to the tongues and grooves of the flooring to be finished, a pair of feed rollers for moving said strips continuously between said guides, the lower guide being provided with clearing openings, and means for cleaning, applying filler and removing the surplus filler from the face of said strip in its passage therethrough.

25. An apparatus for finishing strips of lumber comprising a guide way for supporting and guiding a strip of lumber, means for moving said strip in said guide way, a receptacle having a discharge opening to apply filler to one face of said strip in its passage therethrough, a pressure bar arranged to one side of said discharge opening adapted to contact with the face of said strip, means for scraping and rubbing into the pores of said strip the filler applied and means for wiping the face of said strip for removing the surplus filler therefrom.

26. An apparatus for finishing strips of lumber having means for supporting and moving a strip of lumber in a defined path, means for applying a filler to the face of said strip in its passage through said apparatus, means for scraping and rubbing into the pores of said strip the filler applied and a revolving wiper arranged to wipe the filler transversely of the grain for wiping in and removing the surplus filler therefrom.

27. An apparatus for finishing strips of lumber having means for supporting and moving the strip of lumber on edge, means for first applying a heavy filler to the face of the strip while in motion, a series of yieldable scrapers arranged to engage the face of the strip for rubbing into the pores of the strip the filler applied and for removing the surplus therefrom and means for finally wiping the face of the strip transversely thereof for removing the surplus filler therefrom.

28. An apparatus for finishing strips of lumber having means for supporting and moving strips of lumber, means for first applying a heavy filler to the face of the strip under pressure, means for scraping the face of said strip lengthwise for removing the surplus filler therefrom and means for finally wiping the strip transversely thereof.

29. An apparatus for finishing strips of lumber having means for supporting and moving strips of lumber on edge, means for applying a coating of filler to the face of the strip in its passage therethrough, a series...
of yieldable scrapers arranged to engage the face of the strip in its passage therethrough after the filler has been applied, and revolving means for finally wiping the face of the strip for removing the surplus filler therefrom and polishing the filler applied.

30. An apparatus for finishing flooring comprising a guide way for supporting and guiding a strip of flooring, means for moving a strip in said guide way, means for applying filler to the face of the strip in its passage through said guide way, a series of scrapers disposed in the path of said strip in its passage through said guide way for rubbing in, removing the surplus and burnishing the filler applied, and movable means disposed in the path of travel of said strip for finally wiping the surplus filler from the face of the strip.

31. An apparatus for finishing strips of lumber having means for supporting and moving the strip of lumber in a guide way on edge, means for first applying filler to said strip in its passage through said apparatus and means for forcing the filler lengthwise into the pores of the strip and revolving means for finally removing the surplus filler from said strip.

In testimony whereof I hereunto affix my signature in the presence of two witnesses.

ELMER C. DITTMAR.

Witnesses:

HARRY D. LINNE,
M. F. WILSON.