May 3, 1932. F. C. EASTMAN 1,856,130

CUTTING MACHINE

Filed Jan. 30, 1928

Fig. 1.

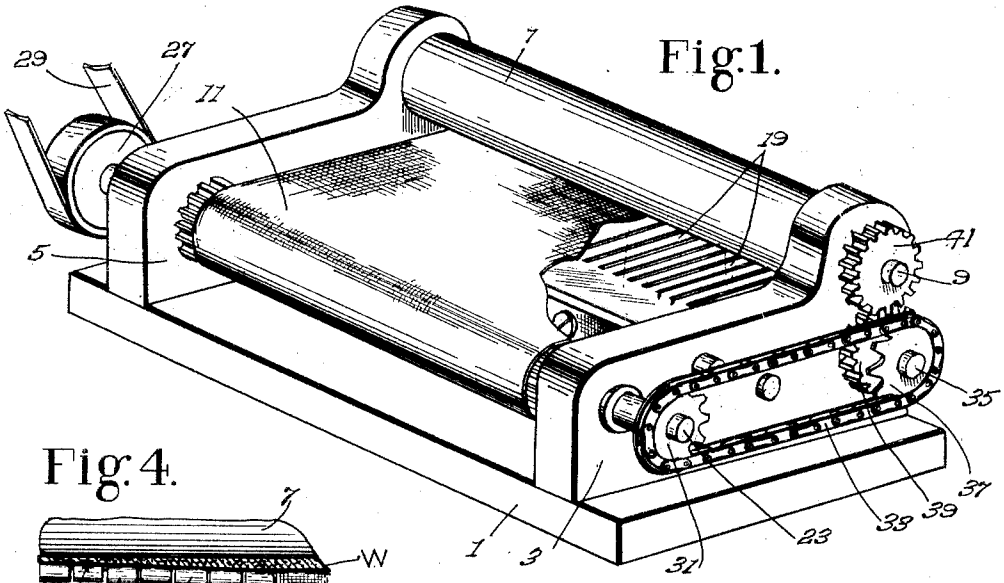


Fig. 4.

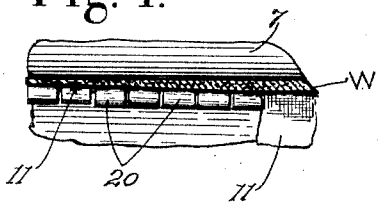


Fig. 2.

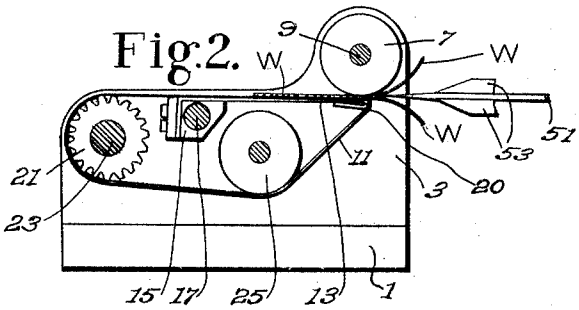
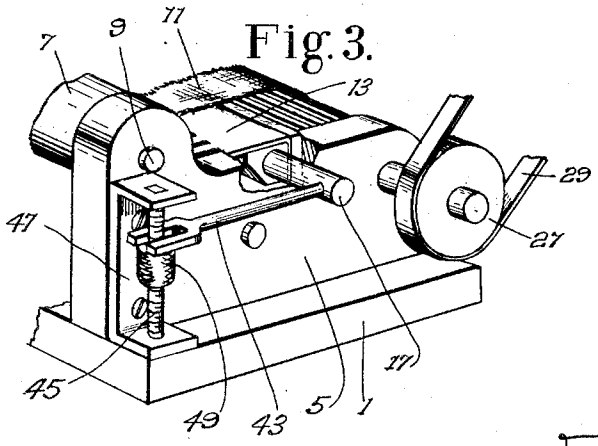


Fig. 3.



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UNITED STATES PATENT OFFICE

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CUTTING MACHINE

Application filed January 30, 1928. Serial No. 250,492.

This invention relates to cutting machines and is herein illustrated as embodied in a machine particularly adapted to split upper leather.

Splitting machines for upper leather commonly comprise two members which cooperate to feed the work to a knife, the edge of which is parallel to the line or elongated locality along which the feed members engage the work. It is desirable—particularly when soft and flimsy upper leather is being operated upon—that the edge of the knife should lie as close as possible to the line along which the feed members engage the work and that the feed members should be so constructed and arranged that the fuzz and lint, which result from the action of the knife, should not interfere with their operation.

According to one feature of the invention, one of the feed members is a conveyor which extends forwardly to a point adjacent to the edge of the knife and then backwardly away from the knife without overlapping the blade thereof. In the illustrated machine the upper feed member is a roll, and the lower feed member is a belt conveyor which travels over a stationary plate and then down over one edge thereof, said edge being located just beneath the feed roll. With such a construction the edge of the knife may be positioned close to the locality in the work which is being gripped by the feed members without danger of the knife damaging the conveyor belt; and any fuzz or lint which may be produced does not affect in any way the efficacy of the conveyor belt.

Inasmuch as leather is commonly not of uniform thickness it is desirable to provide one of the feed members with means for accommodating itself to such unevenness. To this end, according to another feature of the invention, means are provided for permitting different localities of the conveyor to yield independently of one another. In the illustrated construction the conveyor supporting plate referred to above is made of spring steel and is slotted longitudinally to provide a series of independently yieldable tongues over the ends of which the conveyor runs. These tongues have their ends bent back to provide a rounded surface over which the conveyor may run easily; and their rounded ends terminate at a locality just slightly in advance of the edge of the knife so that the conveyor may run in contact with the roll when no work is in the machine without any danger of the knife cutting into the conveyor. With this construction an uneven piece of thin upper leather may be firmly gripped by the feed members in a locality close to the edge of the knife and accurately split.

These and other features of the invention will be more fully understood from the following description of the machine in which the invention is shown as embodied and which will be pointed out in the claims.

In the accompanying drawings,

Fig. 1 is a general view of the machine in perspective;

Fig. 2 is side elevation of the machine, partly in section;

Fig. 3 is a detail view of a side of the machine in perspective; and

Fig. 4 is a fragmentary rear view illustrating the passage of the work between the conveyor and the feed roll.

The frame of the machine comprises a base plate 1 upon which are rigidly secured right and left side members 3 and 5, respectively. A feed roll 7, of the character ordinarily employed in leather splitting machines, is carried upon a shaft 9, which is mounted at either end in bearings disposed in the side members 3 and 5, respectively. Cooperating with the roll 7 is an endless conveyor belt 11, which may be of heavy textile fabric or of other suitable material. A support for the conveyor belt 11 in the form of a flat sheet or plate 13 of resilient material, preferably of spring steel, is rigidly secured at its forward end upon a bar 15 carried upon a shaft 17 which is parallel to the shaft 9, the shaft 17 being mounted at either end in bearings disposed in the side frame members 3 and 5, respectively, somewhat below the level of the shaft 9 and about a third of the distance from the front to the rear ends of the side frame members, so that the belt-supporting plate 13 extends from the bar 15 rearwardly

and substantially horizontally to a point beneath the feed roll 7. The belt supporting plate 13 has a plurality of parallel slits extending longitudinally to a locality near its forward end, leaving that portion adjacent to the bar 15 unbroken and providing a plurality of parallel adjacent rearwardly extending resilient tongues 19 which are part of and integral with the plate 13, but which may yield independently of one another. Slightly beyond their point of engagement with the feed roll 7 the tongues 19 are bent under for a short distance to present a smooth rounded end 20 which will not injure the conveyor belt 11.

A belt driving roll 21, equal in diameter to the feed roll 7 and having longitudinal corrugations to provide a better gripping surface, is carried upon a shaft 23, which is parellel to the shaft 9, being mounted at either end in bearings disposed in the forward ends of the side members 3 and 5, resectively. The highest portion of the belt driving roll 21 is disposed in or slightly above the general plane of the belt supporting plate 13. The conveyor belt 11 passes around its driving roll 21, over its supporting plate 13, around the end 20 of the supporting plate as the belt terminates its advance run and begins its return run, and under an idler roll 25 which is disposed under the central portion of the supporting plate 13 and in parallel relation to the rolls 7 and 21, and is mounted in any suitable manner for taking up any slack in the belt 11.

The shaft 23 extends at either end beyond its bearings in the respective side frame members; and the end of the shaft 23 which extends beyond the side frame member 5 carries a pulley 27 driven by a belt 29. The opposite end of the shaft 23 carries a sprocket wheel 31 which drives a chain 33. Extending outwardly from the side frame member 3 and beneath the shaft 9 is a stud shaft or axle 35, upon which axle is rotatably mounted a sprocket wheel 37, equal in diameter and in number of teeth to the sprocket wheel 31, and driven by the chain 33. Rotatably mounted upon the shaft 35 and secured to the sprocket wheel 37 is a spur gear 39 which meshes with and drives a spur gear 41 equal in diameter and in number of teeth, and securely fixed to the adjacent extended end of the shaft 9. In the above description of the driving mechanism, it will be apparent that the conveyor belt driving roll 21 is driven by the belt 29 through the pulley 27 and the shaft 23; and that the feed roll 7 is driven by the belt 29 at a speed equal to, and in an opposite direction from, that of the conveyor belt driving roll 21, such drive being through the pulley 27, the shaft 23, the sprocket wheel 31, the chain 33, the sprocket wheel 37, the spur gear 39, the spur gear 41, and the shaft 9. It will further be apparent that, since the rolls 7 and 21 are of equal diameter and are driven at equal speeds, their peripheral velocities will be equal, and therefore the velocity of the conveyor belt 11 will be equal to the peripheral velocity of the roll 7, and as the conveyor belt 11 and the surface of the feed roll 7 are travelling at the same velocities and also, at their point of contact, in the same direction, no slippage between these two feed elements can occur.

Provision is made for the angular adjustment of the supporting plate 13 by extending the shaft 17 outwardly through its bearing in the side frame member 5. A rocker arm or crank 43 extends radially from the extended end of the shaft 17, and is forked at its outer end so as to extend loosely on either side of a threaded rod 45 securely fixed in a bracket 47 mounted on the outside of the side frame member 5. A knurled adjusting nut 49, of sufficient diameter to prevent it from passing through the forked end of the arm 43, is threaded on the rod 45; and by rotation of the nut 49 the arm 43 may be rocked to rotate the shaft 17 and the bar 15 and thus to adjust the spring plate 13 so as to bring the ends 20 of the tongues 19 into contact, with whatever degree of pressure may be desired, with the surface of the feed roll 7; or, if desired, to leave a slight space between the ends 20 and the roll 7 to accommodate the thickness of the work to be passed through the machine. For thin work, the ends 20 may be brought to bear with relatively high pressure against the roll 7; for work of medium thickness, the ends 20 will be brought to bear with only slight pressure, or mere contact may be sufficient; while for thick work, the ends 20 may not even be brought into contact with the roll 7, but may be spaced therefrom by a distance less than the thickness of the work, which will, in passing through the machine, build up the desired pressure.

A belt knife 51, carried between guides 53, has its operative run disposed substantially in the general plane of the supporting plate 13, the cutting edge of the knife 51 being substantially parallel to the roll 7, and in very close proximity to the ends 20 of the spring tongues 19, but without overlapping the ends 20 or the feed belt 11. In other words, the belt 11 is spaced from the knife 51 in the direction of feed movement of the work, as is clearly shown in Fig. 2. In order to simplify the drawings and because it has nothing to do with the present invention, no means has been shown for adjusting the roll 7 vertically so as to vary the thickness of the finished product. It will be understood, however, that any of the well-known means may be provided if desired.

The operation of the machine will be apparent from the foregoing description. In Fig. 4 the passage of a piece of work W be-

tween the conveyor belt 11 (supported by the ends 20 of the spring tongues 19) and the roll 7 is illustrated. The work W is shown as of irregular thickness along its width; and as the belt 11 is flexible and the spring tongues 19 are independently yieldable, all portions of the work W will be held in firm contact with the roll 7. The spring tongues 19 are relatively narrow, and a sufficient number of them are provided to accommodate any kind of local irregularity in the thickness of the work W. It will be noted that the spring tongues 19 extend entirely across the belt 11, and along the length of the roll 7.

In Fig. 2 the work W is shown as being split into two sheets, W′ and W″, the sheet W′ having been split to a uniform thickness as determined by the distance from the plane of the knife to the under side of the roll. The sheet W″ has all the original irregularities of the material, and may be run through the machine again or discarded.

Although the invention has been set forth as embodied in an illustrative machine in which the supporting plate is horizontal and the knife is an endless one, it should be understood that the invention is not limited in the scope of its application to the particular machine which has been shown and described.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. A machine of the class described having, in combination, a splitting knife and a pair of feed members for gripping the work and feeding it to said knife, one of said members being adapted to travel in a closed path extending to a point adjacent to the edge of said knife, and then extending away from said knife without overlapping the blade thereof.

2. A machine of the class described having, in combination, a feed roll, a knife positioned with its edge adjacent to the periphery of said roll, and a moving conveyor adapted to co-operate with said roll in feeding work to the knife, said conveyor being constructed and arranged to extend forwardly to a point adjacent to the edge of said knife and then backwardly away from the knife without overlapping the blade thereof.

3. A machine of the class described having, in combination, a knife, two members adapted to co-operate to feed the work to the knife, one of said members being an endless conveyor, and a plate having yielding tongues formed at one end thereof for supporting the conveyor adjacent to the other feed member, said tongues having ends around which said conveyor passes as the conveyor terminates its advance run and begins its return run.

4. A machine of the class described having, in combination, a knife, a feed roll, a resilient plate having a work-supporting surface adapted to press the work against said roll, said plate being mounted for swinging movement toward and from said roll to provide for adjustment of the pressure of the plate against the work, and means for securing the plate in adjusted position.

5. A machine of the class described having, in combination, a knife, a feed roll, a conveyor belt, and a plate constructed and arranged to hold the conveyor belt against the feed roll, the plate having a rounded end around which the belt passes in an abrupt turn.

6. A machine of the class described having, in combination, a knife, a feed roll, a conveyor belt, and a plate constructed and arranged to hold the conveyor belt against the feed roll, the plate having an end adjacent said feed roll bent double and away from said feed roll, so as to present a smooth end about which the conveyor belt passes in an abrupt turn.

7. A machine of the class described having, in combination, a splitting knife, a feed roll adjacent thereto, a conveyor belt adapted to co-operate with the roll in advancing work to the knife, and a member for supporting the belt adjacent to the roll and knife, the conveyor belt being located wholly on one side of a plane passed through the edge of the knife perpendicular to the plane of the knife.

8. A machine of the class described having, in combination, a splitting knife, a feed roll adjacent thereto, an endless conveyor having a run which moves forward toward the knife and roll and a second run which moves backward diagonally away from the roll and knife, and a conveyor support extending into the angle between the two runs of the conveyor, the extreme forward portion of the conveyor terminating short of a plane passed through the edge of the knife perpendicular to the plane of the knife.

9. A machine of the class described having, in combination, a splitting knife, a feed roll adjacent thereto, an endless conveyor having a run which moves forward toward the knife and roll and a second run which moves backward diagonally away from the roll and knife, and a conveyor support comprising a plate having yielding tongues at one end thereof around which the conveyor passes in an abrupt turn.

10. A machine of the class described having, in combination, a splitting knife, a feed roll, a substantially horizontal resilient plate held from movement at one end and having its free end extending beneath the roll, a belt for cooperating with the roll in advancing work to the knife, and means for causing the belt to travel forwardly toward the roll in contact with the upper surface of the plate and then about the free end of the plate downwardly and backwardly.

11. In a machine of the class described, a

splitting knife, and a movable feed member for feeding work to the knife, said movable feed member extending to a point in proximity to the edge of the knife but spaced therefrom in the path of feed movement of the work, and then extending away from said path of feed movement without overlapping the knife in a zone in which the knife may engage the movable feed member.

In testimony whereof I have signed my name to this specification.

FRED C. EASTMAN.