Sept. 6, 1927. 1,641,678

T. D. HODGE

KICK-OFF FOR SHEARS

Filed Aug. 6, 1925 2 Sheets-Sheet 1

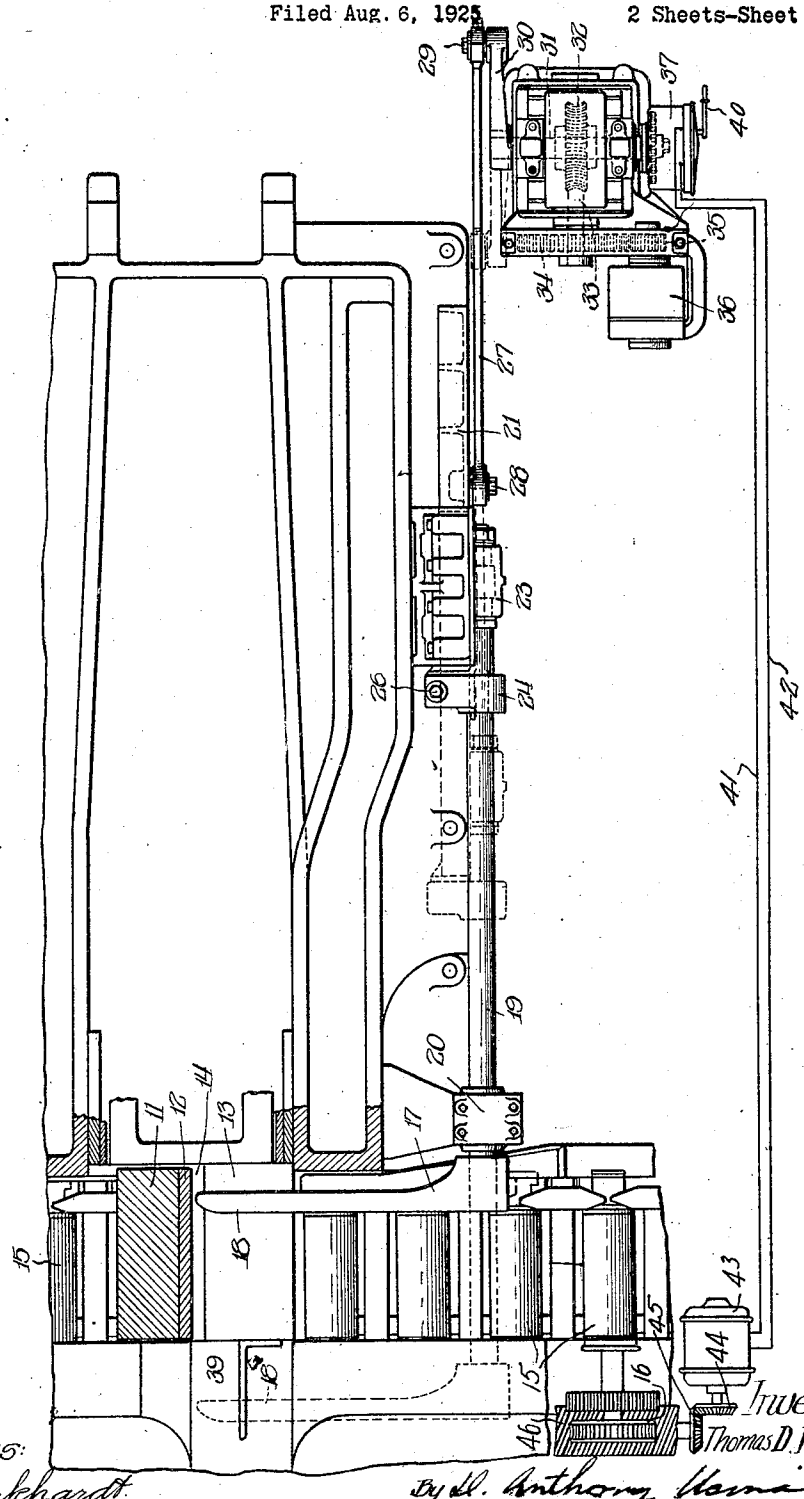


Fig. 1.

Witness:
R. Burkhardt

Inventor:
Thomas D. Hodge,
by H. Anthony Hann
attg.

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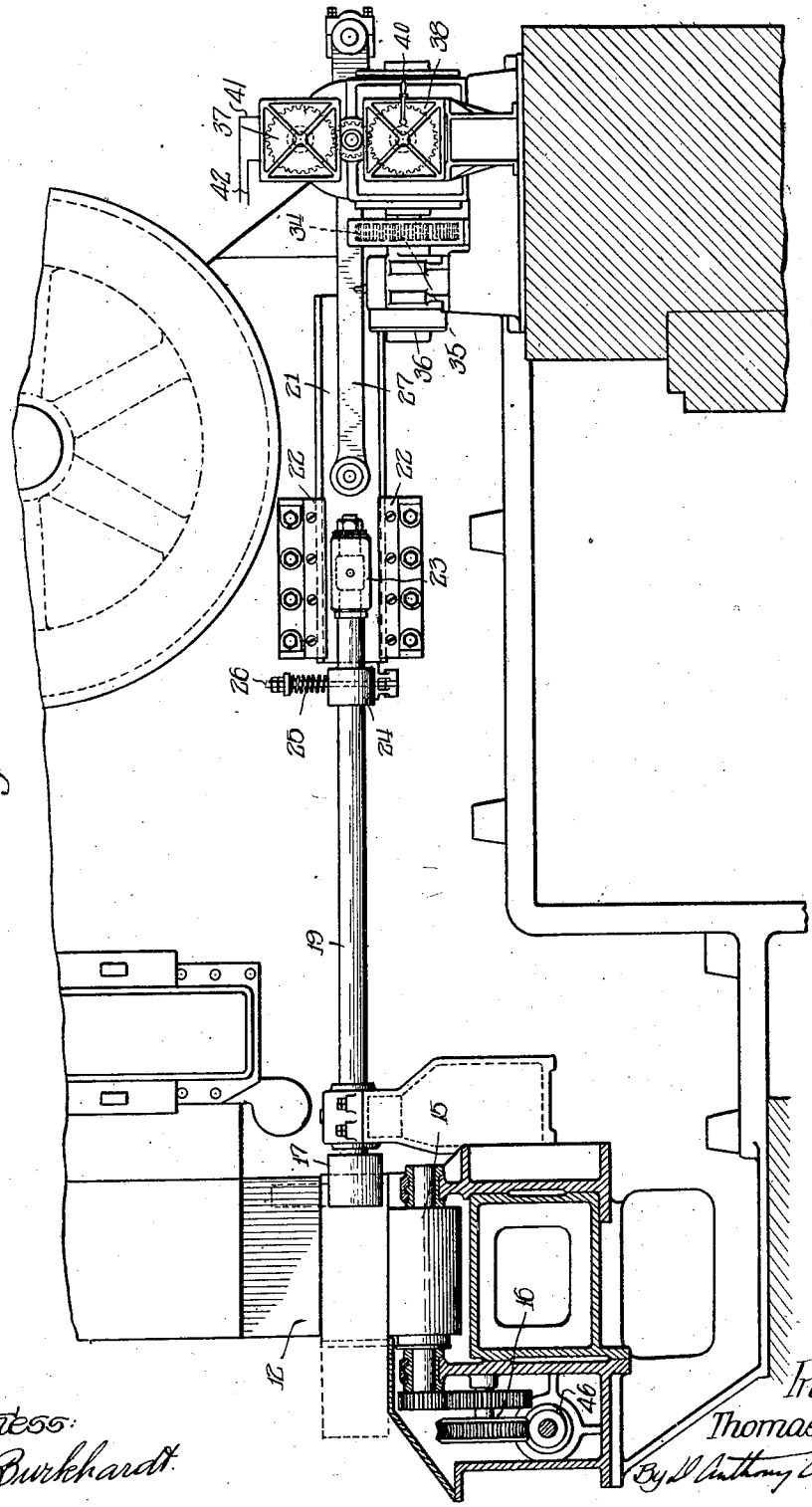


Fig. 2.

Witness:
R. Burkhardt

Inventor:
Thomas D. Hodge,
By Anthony Thomas
Atty.

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UNITED STATES PATENT OFFICE.

THOMAS D. HODGE, OF DULUTH, MINNESOTA.

KICK-OFF FOR SHEARS.

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This invention relates to a new and improved kicker or push off for shears and more particularly, to an apparatus of this character adapted to kick off scrap ends cut off by shears.

Shears are commonly used in connection with blooming mills for the purpose of shearing off imperfect ends of the blooms and it is desired to kick or push off the crop ends from the roll table. The roll table carries on the sheared blooms for further operation. It is important that such a kicker or push off be so coordinated with the movement of blooms over the roll table that their movement is not obstructed.

It is an object of the present invention to provide a kicker or push off associated with shears and adapted to selectively push out ends from the roll table.

It is a further object to provide a construction of this character in which the kicker is closely associated with the shear blade, so as to handle crop ends of small size.

It is an additional object to provide such a kicker so related with the roll table drive as to prevent interference of the push off with movement of blooms over the table.

Other and further objects will appear as the description proceeds.

I have illustrated a preferred embodiment of my invention in the accompanying drawings, in which—

Figure 1 is a plan view of the kick off and portions of the associated shear and roll table, and

Figure 2 is an elevation of construction shown in Figure 1.

The shear comprises the upper jaw 11 carrying the knife or blade 12, this jaw and knife remaining fixed during the shearing operation. It also comprises the lower movable jaw 13 carrying the knife 14. The method of operation of the jaw forms no part of the present invention and need not be described in detail.

It will be understood that the lower jaw 13 is raised in the shearing operation so that the edge of the knife 14 passes the edge of the knife 12. The blooms are fed to the shears by the roll table 15 and carried away by the further extension of the same table. This roll table is driven by the gears 16 shown in Figure 2, but as this drive forms no part of the present invention, it need not be described in detail.

The kicker, or push off comprises the elongated foot 17, the outer end 18 of which lies over the movable jaw 13 and knife 14. This foot 17 is fixedly secured to the rod 19. This rod is carried in the bearing 20 and is reciprocated in that bearing by the slide member 21, which is guided in the members 22 secured to the side of the shear frame. The end of the rod 19 is secured in the bearing 23 carried by the slide 21 and is free to rotate in that bearing. The arm 24 is secured to the rod 19 and the spring 25 carried by the rod 26 bears down on the arm 24 and thus holds the extended end 18 of the foot down against the movable jaw.

The slide 21 is reciprocated by means of the connecting rod 27 which is pivotally connected to the slide at 28 and similarly connected at 29 to the crank 30. This crank 30 is carried by shaft 31 which is driven through worm gear 32 by shaft 33. The shaft 33 is driven by gear 34 which meshes with gear 35 driven by motor 36. The motor 36 is controlled by two limit switches 37 and 38, the function of which will be described hereafter.

The limit switch 38 is operated by the handle 40. The limit switch 37 is operated by movement of the gears driven by motor 36 when the kicker is operated. This switch 37 is connected by wires 41 and 42 to the motor 43, which, through gears 44 and 45, drives the worm 46. This worm 46, through worm gear 16, drives the conveyor rolls 15.

As indicated in dotted lines in Figure 1, the stroke of the pusher foot 17 carries it beyond the roll table and movable jaw and in order to prevent it dropping down, the guide and supporting angle 39 is secured to the outer face of the movable jaw as clearly shown in Figure 1.

In the use of the kick off, the blooms to be sheared are brought to the sheared jaws by the roll table 15. The movement of the roll table is then stopped by any suitable control, which has not been shown, and the shears are operated by a shear control to raise the lower jaw and shear off the end of the bloom. As soon as the shearing action has taken place, and either before or after the lower jaw has returned to its lower position, the limit switch 38 is operated by means

of handle 40. This switch causes the motor 36 to go into operation and thus through the gears and the crank 30 forces the kicker foot to the left pushing the crop end of the bloom off of the roll table and movable shear jaw. This movement of the crank 30 continues until the crank has made a complete revolution and the kicker foot is drawn back to the full line position of Figure 1.

The limit switch 37 is in the circuit control of the drive of the roll table 15 and prevents operation of the table until the kicker foot 18 has returned to the full line position. The switch 37 breaks the circuit to motor 43 as soon as the kicker starts in operation and this circuit is not restored until the kicker has returned to the rest position. Otherwise, as will be apparent, a bloom might be advanced between the jaws and behind the kicker foot when it is in its outer position. This would cause a tie-up and possible breakage of parts as the kicker foot is drawn back. The limit switch controlling the kicker operation causes it to go through a full kicking movement with but a single manual operation of the control. This control can be interlocked with the control which causes the shear to operate so that the kicker goes into operation immediately upon the completion of the cutting stroke of the shears.

I have shown one preferred embodiment of my invention by way of illustration, but it is to be understood that I contemplate such changes and modifications as come within the spirit and scope of the accompanying claims.

I claim:

1. In combination with a shear, means for feeding material to the shear, a conveyor for carrying material from the shear and a kicker operating transversely of the conveyor to discharge material therefrom, the kicker moving with the movable blade of the shear.

2. In combination with a shear, means for feeding material to the shear, a conveyor for carrying material from the shear, and a kicker operating transversely of the conveyor to discharge material therefrom being pivotally supported upon means for reciprocating it, and having a portion resting upon the lower shear blade whereby it is moved with said blade.

3. In combination with a shear, a conveyor for feeding material to the shear, a conveyor for carrying material from the shear, a kicker having a portion resting upon the lower shear blade, means for moving the kicker transversely across the conveyor, and an extension on the lower shear blade to support the kicker at its limit of movement.

4. In combination with a shear, a conveyor for feeding material to the shear, a conveyor for carrying material from the shear, means for selectively discharging material from the second conveyor, a control for the conveyors, a control for the discharging means and means interlocking the controls whereby the conveyors are stopped during the operation of the discharging means.

5. In combination with a shear, a conveyor for feeding material to the shear, a conveyor for carrying material from the shear, a kicker for selectively discharging material from the second conveyor, a control for the feeding conveyor, a control for the kicker, and means interlocking the controls whereby movement of the conveyor is stopped during operation of the kicker.

Signed at Duluth, Minnesota, this 23 day of July, 1925.

THOMAS D. HODGE.