

No. 851,213.

PATENTED APR. 23, 1907.

M. H. BALLARD.
GEARING.

APPLICATION FILED DEC. 26, 1905.

2 SHEETS—SHEET 1.

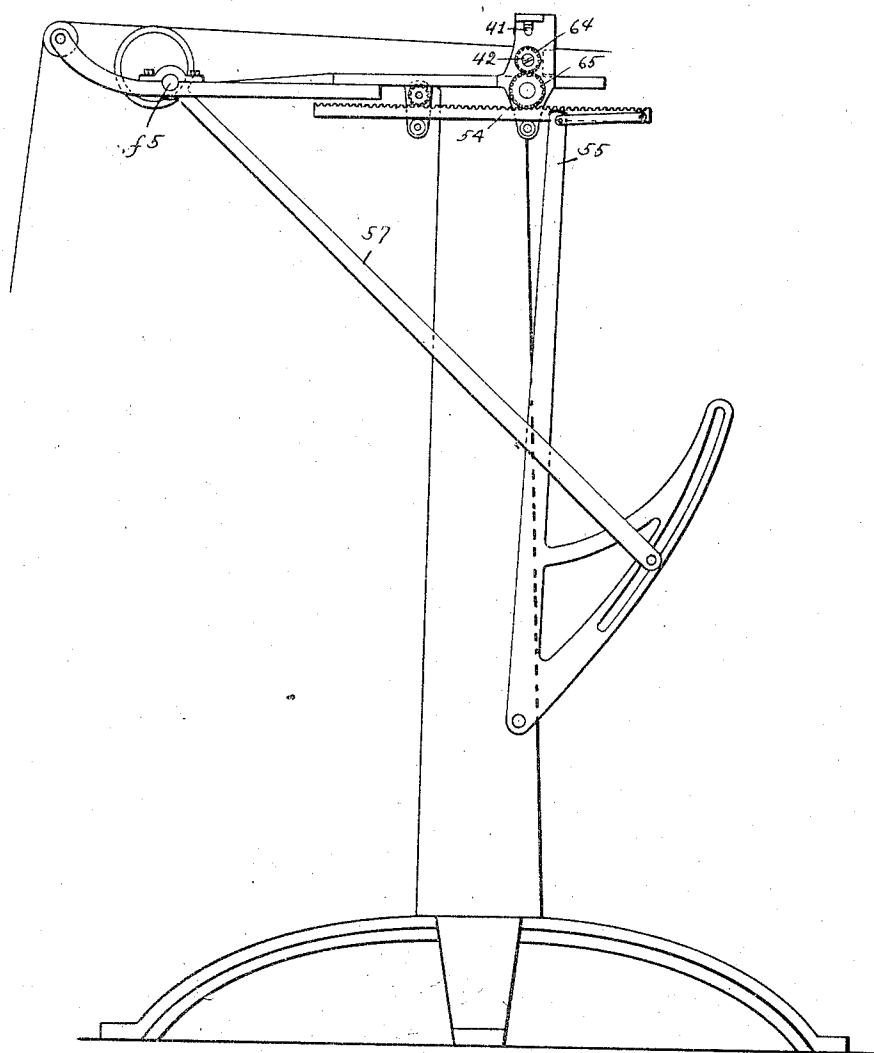


Fig. 1.

Witnesses:

H. B. Davis.

Cynthia Doyle

Inventor:

Milton H. Ballard

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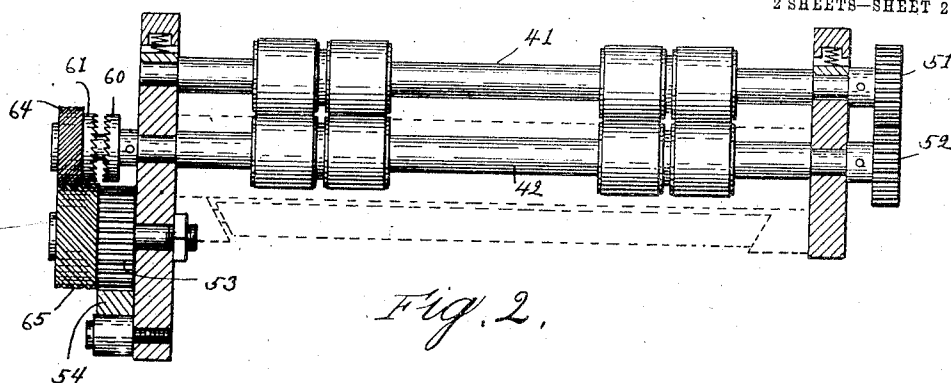


Fig. 2.

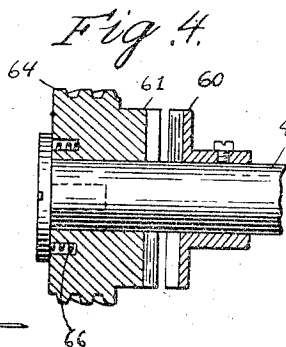


Fig. 4.

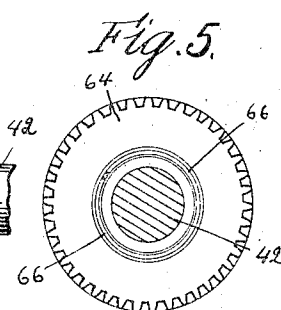


Fig. 5.

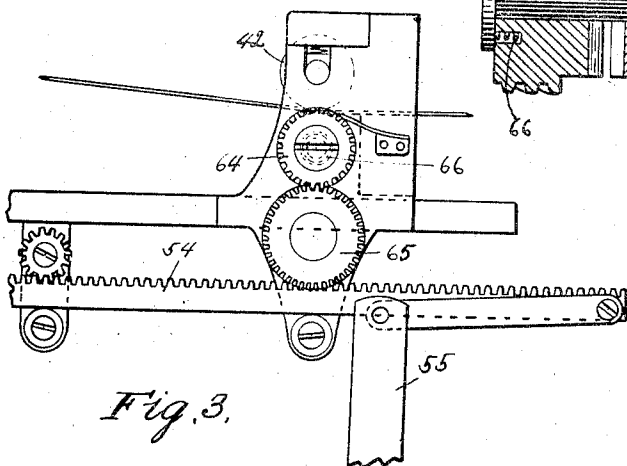


Fig. 3.

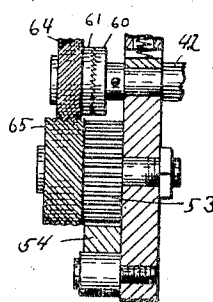


Fig. 6.

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UNITED STATES PATENT OFFICE.

MILTON H. BALLARD, OF LYNN, MASSACHUSETTS, ASSIGNOR TO TRIPP
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GEARING.

No. 851,213.

Specification of Letters Patent.

Patented April 23, 1907.

Application filed December 26, 1905. Serial No. 293,221.

To all whom it may concern:

Be it known that I, MILTON H. BALLARD, of Lynn, county of Essex, State of Massachusetts, have invented an Improvement in Gearing, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

This invention relates to gearing especially adapted to be employed for operating the paper feeding device of a wrapping machine.

In certain forms of wrapping machines, as for instance, in the wrapping machine shown in Letters Patent No. 516,136 dated March 6, 1894, the paper, in strip form, is taken from a reel and fed forward by means of suitable intermittently operated feeding rolls. In said patent the means for operating the feeding rolls to intermittently feed forward the paper, is connected with one of said rolls by a pawl and ratchet.

In practice the machine is run at a very high speed and as a result the pawl and ratchet connection soon wears out and this invention has for its object to provide improved means of greater durability for intermittently operating the paper feeding rolls.

The invention consists essentially of means for intermittently operating the feed rolls comprising essentially a pair of spiral gears in engagement with each other and revolvable on parallel axes, one of which is movable longitudinally on its support and the other is restrained from longitudinal movement, means for revolving said restrained gear, first in one and then in the other direction to thereby revolve the other gear and also to move it longitudinally on its support, a movable clutch member connected with said longitudinally movable gear and a fixed clutch member connected with one of the feed rolls into and out of engagement with which the aforesaid clutch member is movable.

Figure 1 shows in side elevation a paper feeding device for wrapping machines embodying this invention. Fig. 2 is a front elevation of the feeding rolls and actuating device therefor. Fig. 3 is a side view of the feeding rolls and actuating device therefor. Fig. 4 is an enlarged longitudinal section of the driven spiral gear of the pair of spiral

gears which constitute the essential elements of the actuating device. Fig. 5 is a side view of the driven spiral gear. Fig. 6 is a front view of the actuating device shown in Fig. 2, the clutch members being in engagement.

41 and 42 represent the two paper feeding rolls, which are journaled in suitable bearings and arranged one above the other to receive the strip of paper between them and feed it along as the rolls are rotated. Spur gears 51, 52 are secured respectively to the rolls 41, 42, which engage each other, said gears enabling one of the rolls to be driven positively by the other roll. As herein shown the lower roll 42 is designed to serve as the driving roll, the upper roll 41 being driven by it. The driving roll 42 is designed to be rotated intermittently, so that the strip of paper will be fed forward intermittently, and its end portion repeatedly presented to a paper-cutting device, not shown, which severs the strip to from wrappers.

One member of a clutch is secured to the journal of the driving roll 42, which is herein shown as a disk 60, having ratchet teeth formed on its outer side or face, said disk 60 constituting the fixed clutch member. The movable clutch member consists of a like disk 61 mounted to slide on said journal into and out of engagement with the fixed clutch member 60, said disk 61 having ratchet teeth formed on its side or face adjacent the fixed clutch member. When the movable clutch member is slid along on the journal into engagement with the fixed clutch member, the two ratchet toothed faces of said members are brought into engagement. The movable clutch member 61 is also rotatably mounted on said journal, so that when slid along thereon and brought into engagement with the fixed clutch member 60, it may be rotated to rotate the driving roll 42. The movable clutch member is secured to one side or face of a spiral gear 64, or is connected to said spiral gear in such manner as to be operated by it. The spiral gear 64 is mounted on said journal, and is adapted to rotate thereon and also to move thereon longitudinally. The spiral gear 64 is engaged and driven by a spiral gear 65 which is mounted on a fixed stud or other bearing which may be provided for it and which is made wider than the spiral gear 64. A pinion 53 is also

mounted on said stud which is secured to the spiral gear 65. The fixed stud on which the spiral gear 65 and pinion are mounted is disposed in parallelism with the journals supporting the spiral gear 64 and the clutch members, so that the two spiral gears 65 and 64 revolve on parallel axes. The spiral gear 65 is restrained from sidewise or longitudinal movement on the fixed stud so that when revolved thereon it will operate to revolve the spiral gear 64 and also to move said gear sidewise or longitudinally on its support, or in a direction toward and from the fixed clutch member. A rack bar 54 engages said pinion 53 which is loosely connected at one end by a link to an upright arm 55, which is pivoted at its lower end to the frame, and which has extended from it, at or near its lower end, a curved slotted arm, or it may be an arm provided with a curved slot, to which is adjustably connected one end of a bar 57, which is connected by an eccentric to the main shaft f^s . As the main shaft f^s is rotated the rack bar 54 will be reciprocated longitudinally and the pinion which it engages will be revolved first in one and then in the other direction and the spiral gear 65 to which it is connected will be likewise revolved and the spiral gear 64 will be revolved and also moved along on the journal supporting it to thereby move the movable clutch-member into and out of engagement with the fixed clutch member and to revolve it, such sidewise or longitudinal movement on the spiral gear 64 being due to the inclined formation of the teeth of the spiral gears. While the movable clutch member is in engagement with the fixed clutch member and is revolving, the roll 42 will be correspondingly revolved and while said movable clutch member is out of engagement with said fixed clutch member the roll 42 will remain at rest. Thus the roll is revolved intermittently and in the same direction. The rack bar 54 operates to turn the spiral gear 65 a number of revolutions to thereby rotate the driving roll 42 a number of revolutions to feed forward a considerable length of paper and by adjusting the connection of the bar 57 with the curved slotted extension on the upright arm 55 the number of revolutions given to the spiral gear 65 may be regulated and the length of paper which is fed forward thereby determined.

By employing spiral gears, as contrasted with spur gears, or gears of other forms, the driven gear 64 is given these two movements, and results in the production of an actuating device for intermittently rotating the roll 42, which is very simple and has great durability. On the outer side of the spiral gear 64 a

spring 66 is preferably provided, which will be contained in a circular groove formed therein, one end of which bears against said spiral gear 64 and the other end of which bears against a fixed stop, the action of said spring being to move the spiral gear 64 in a direction to cause the movable clutch member to engage the fixed clutch member, and while I prefer to employ the spring for this purpose which results in more speedily moving the movable clutch member into engagement with the fixed member, I find in practice that it may be omitted, as the driven spiral gear will be moved longitudinally as well as rotarily by the driving spiral gear, and produce an efficient actuating device.

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

1. The combination with a member adapted to be rotated intermittently and provided with a clutch-member, of a pair of spiral gears in engagement with each other and revoluble on parallel axes, one of which is movable longitudinally on its support and provided with a clutch-member, and the other is restrained from longitudinal movement, means for revolving said restrained gear first in one and then in the other direction to thereby revolve the other gear and also move it longitudinally on its support and move the clutch member which is connected with it and the clutch-member on the member to be rotated into and out of engagement, substantially as described.

2. The combination with a member adapted to be rotated intermittently and provided with a clutch-member, of a pair of spiral gears in engagement with each other and revoluble on parallel axes, one of which is movable longitudinally on its support and provided with a clutch-member, and the other is restrained from longitudinal movement, a pinion connected with the restrained gear, a longitudinally reciprocating bar engaging it for revolving said restrained gear first in one and then in the other direction, to thereby revolve the gear which it engages and also move said gear longitudinally on its support and move the clutch-member connected with it and the clutch-member on the member to be rotated into and out of engagement, substantially as described.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

MILTON H. BALLARD.

Witnesses:

B. J. NOYES,

H. B. DAVIS.