

C. L. JOY.
CUTLERY GRINDING MACHINE.
APPLICATION FILED OCT. 4, 1906.

940,930.

Patented Nov. 23, 1909.

2 SHEETS—SHEET 1.

Fig. 1.

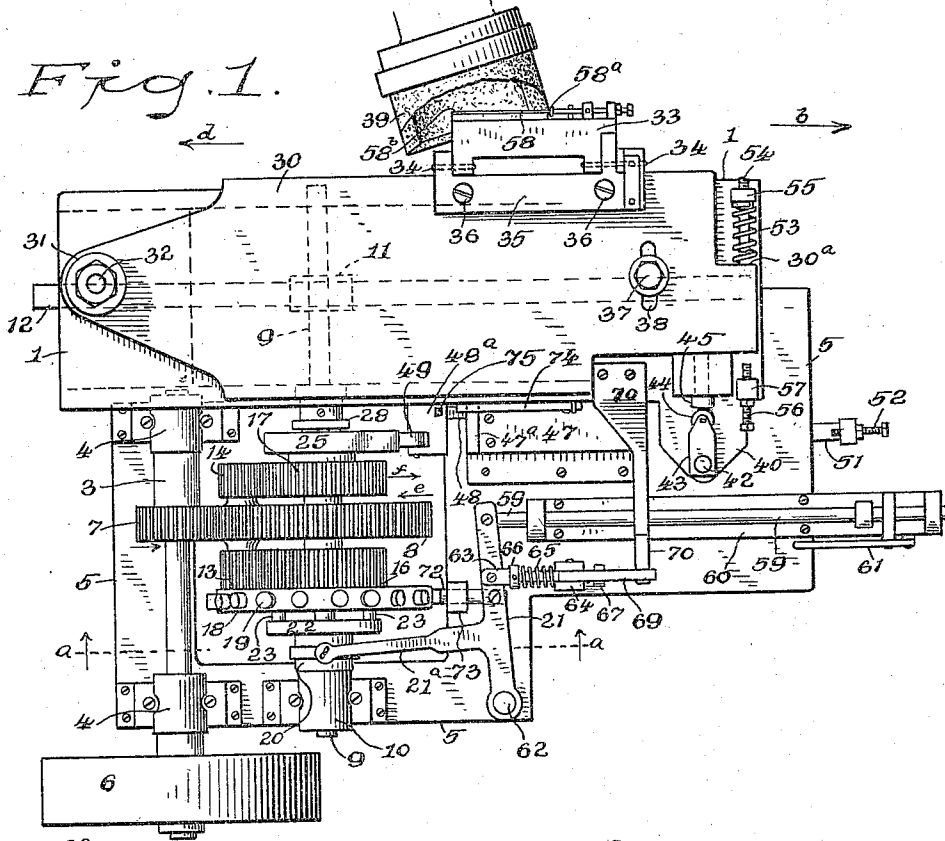
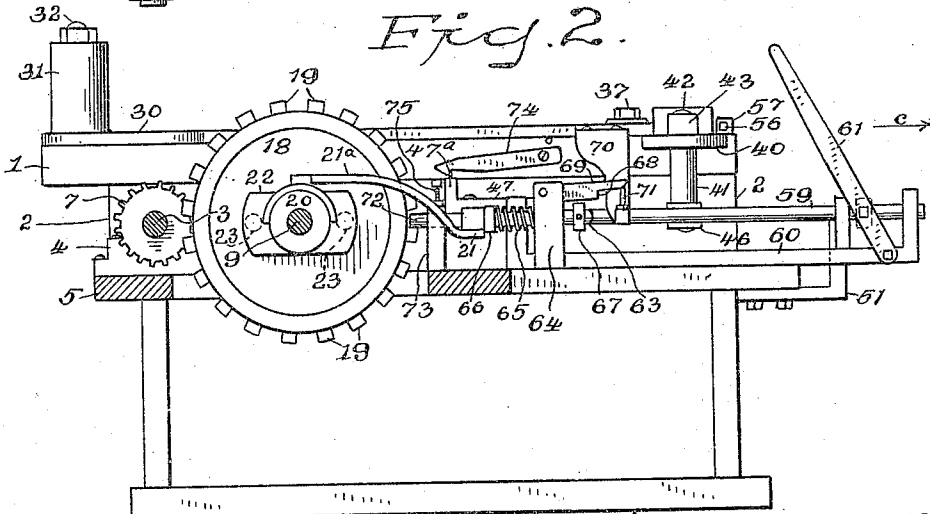


Fig. 2.



WITNESSES

H. A. Lamb.

G. W. Fium

INVENTOR

Charles L. Joy.

BY Geo. D. Phillips

his ATTORNEY

C. L. JOY.
CUTLERY GRINDING MACHINE.
APPLICATION FILED OCT. 4, 1906.

940,930.

Patented Nov. 23, 1909.

2 SHEETS—SHEET 2.

Fig. 3.

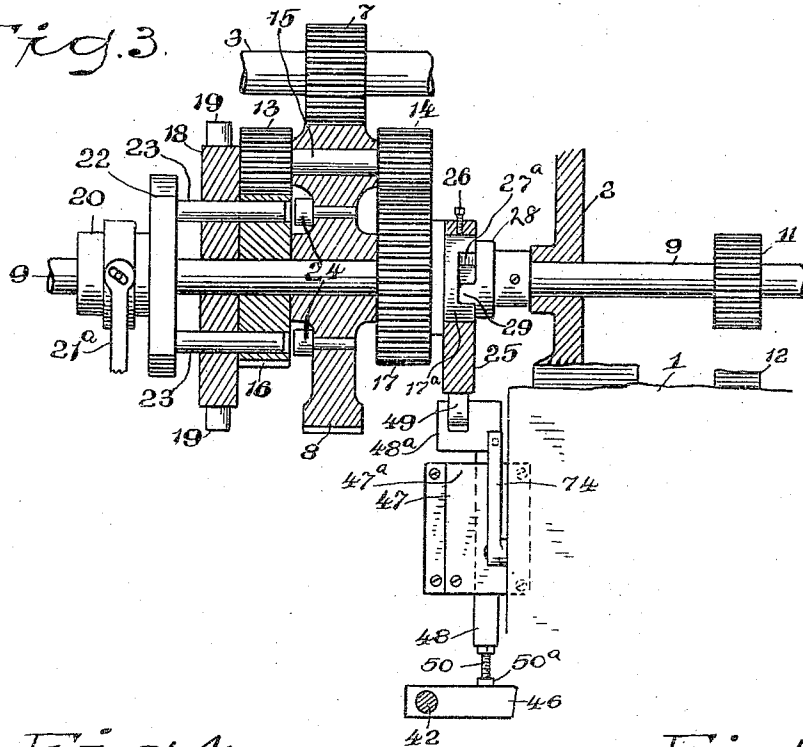


Fig. 4.

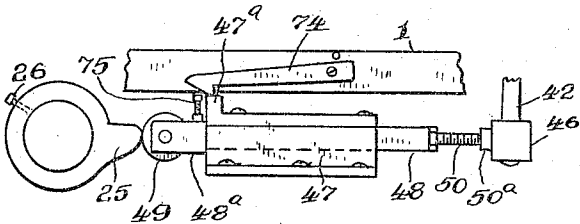


Fig. 5.

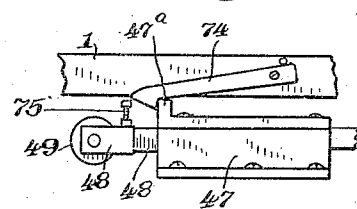


Fig. 6.

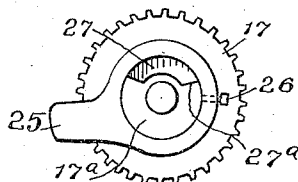
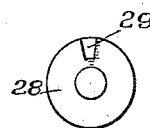


Fig. 7.



WITNESSES

H. A. Lamb.
G. W. Finn

INVENTOR:

Charles L. Joy
BY Geo. D. Phillips

his ATTORNEY.

UNITED STATES PATENT OFFICE.

CHARLES L. JOY, OF NEW HAVEN, CONNECTICUT.

CUTLERY-GRINDING MACHINE.

940,930.

Specification of Letters Patent.

Patented Nov. 23, 1909.

Application filed October 4, 1906. Serial No. 337,405.

To all whom it may concern:

Be it known that I, CHARLES L. JOY, a citizen of the United States, and a resident of New Haven, in the county of New Haven and State of Connecticut, have invented certain new and useful Improvements in Cutlery-Grinding Machines, of which the following is a specification.

My invention relates to cutlery grinding machines, and it consists in certain details of construction to be more fully set forth in the following specification.

To enable others to understand my invention reference is had to the accompanying drawings in which:

Figure 1 is a plan view of the machine, and broken view of the grinding-wheel. Fig. 2 is a side elevation of the machine and sectional view of the bed; the driving and reversing shaft on line *a* of Fig. 1; Fig. 3 is an enlarged broken upper plan view of the carriage, broken sectional view of the carriage support, broken view of the driving and reversing shafts and plan view partly in section of the carriage driving and reversing shaft mechanism: Figs. 4—5—6 and 7 are detail views pertaining to the carriage movement and reversing mechanism.

The driving and reversing mechanism for imparting movement to the carriage 1, mounted on the fixed support 2, is constructed as follows:

3 is the main driving shaft journaled in the standards 4 of the bed 5, and 6 is the driving pulley for said shaft.

7 is a pinion mounted on shaft 3, which pinion meshes with the continuously running gear 8 journaled on the carriage operating shaft 9. This shaft is journaled in the standard 10 of the machine bed and also in the carriage support 2.

11 is a pinion on shaft 9 adapted to engage with the rack 12 secured to the carriage 1.

13 and 14 are planet pinions secured to the projecting ends of the short shaft 15, Fig. 3, which shaft is journaled in the gear 8. The pinion 13 meshes with the gear 16, and the pinion 14 meshes with the gear 17.

18 (see also Figs. 1 and 2) is a circular disk carrying on its periphery the stop-pins 19. The sleeve 20, disk 18, gears 16 and 17 are all journaled on the shaft 9. The sleeve 20 is also actuated to slide on said shaft through the medium of the lever 21 and the

engagement of its arm 21^a with said sleeve. The flange portion 22 of this sleeve carries the clutch-pins 23 adapted to pass freely through holes in the disk 18 and gear 16 and be brought into contact with the clutch-pins 24 secured to the large gear 8. When, therefore, the clutch pins of said sleeve and gear 8 are engaged, the sleeve, disk, gears 8, 16 and 17 will all be locked together and will rotate on shaft 9 as one member for an accelerated travel of the carriage, and when unlocked, by the withdrawal of the clutch pins 23, the sleeve, disk and gear 16 will remain stationary to effect a slow travel of the carriage in the manner and for the purpose to be hereinafter more fully described.

25 is a cam secured to the hub 17^a of the gear 17 by means of the set-screw 26. 27, see also Fig. 6, is a cutaway portion or recess of this hub, and 28, Figs. 3 and 7, is a collar having the projection 29 adapted to enter this recess of the hub 17^a for the purpose presently to be more fully described.

30 is a swinging plate, and 31 its hub journaled on the stud 32 of the carriage, 1, and adapted thereby to have a lateral swinging movement on said carriage.

33 is a knife-holder hinged to the pins 34 mounted in the knife-holder support 35, which is secured to the swinging plate 30 by screws 36.

37 is a bolt whose body portion projects through the curved slot 38 of the plate 30 and is anchored in the upper surface of the carriage 1. The head of this bolt serves to keep the free end of said plate in operative contact with the carriage.

The lateral movement of the swing plate to and from the grinding wheel 39 is effected as follows; 40 is a projection integral with the carriage, and 41 is a hub extending below said projection and integral therewith, and 42 is a short vertical shaft journaled in said hub. 43 is an arm secured to the upper end of this shaft and carrying at its free end the roll 44 adapted to contact with the pin 45 of the plate 30.

46 is an arm secured on the lower end of the vertical shaft 42 adapted to be actuated to rotate said shaft and bring the upper arm 43 into the position shown at Fig. 1 through the medium of the following mechanism:

47, Figs. 1, 2, 3, and 4, is a box secured to the bed 5, and 48 is a bar adapted to slide

in said box. The head portion 48^a of said bar carries the roll 49 adapted to be engaged by the cam 25, and 50 is an adjusting screw mounted in the opposite end of this bar whose head 50^a contacts with the lower arm 46 to rotate or turn the vertical shaft 42 and thus bring the before mentioned upper arm 43, into the position shown at Fig. 1.

51 is a bracket secured to the underside of the bed 5, the upper end of which carries the adjusting-screw 52 adapted to be engaged by the lower arm 46 and thus cause the vertical shaft 42 to rotate in the opposite direction and carry the roll 44 out of engagement with the pin 45 of the swinging plate 30. When this occurs, the spring 53 will force back said plate into its normal position. This spring is mounted on the short rod 54 anchored in the stud 55 of the carriage 1, and is located between said stud and the shoulder 30^a of the swinging plate 30.

56 is an adjusting screw mounted in stud 57 of the carriage 1 to serve as a stop for the swinging plate and thus locate it in its normal position, viz: with the knife-blade 58 out of contact with the grinding-wheel.

59 is a rod adapted to be moved longitudinally in the standard 60 of the bed 5, and 61 is a handle lever for operating said rod. The forward end of this rod is pivotally connected with the free end of the lever 21, which lever is pivotally supported on the stud 62 of the bed, shown at Fig. 1.

63 is a short rod pivotally supported at the central portion of lever 21, with its free end operatively mounted in the standard 64 of the bed. 65 is a spring located between the collar 66 and the face of said standard to actuate the lever 21 for the purpose presently to be described. 67 is another collar adjustably mounted on rod 63 adapted to be engaged by the shoulder 68 of the locking latch 69, which latch is pivotally supported in the upper forked end of the standard 64.

70 is an arm secured to the movable carriage 1, and 71 is an adjustable pin in its free end adapted to engage with the free end of the locking latch 69 to break the engagement of said latch with the collar 67 of the rod 63.

Operation: The machine is arranged to grind the knife-blade from the shoulder 58^a Fig. 1, to the point or tip 58^b. The carriage will, therefore, run idle when traveling in the direction of arrow *d* in order to bring said shoulder opposite the corner of the grinding wheel. As represented at Fig. 1, the knife-blade is brought against the corner of the wheel at the shoulder 58^a, therefore, the travel of the carriage 1 in the direction of arrow *b*, will cause the blade to be ground from the shoulder to the point, and when the point has passed the wheel, the carriage will come to a stop. An unground knife is then placed on the knife-

holder 33, and the handle-lever 61, is then actuated in the direction of the arrow *c*, Fig. 2, to bring the shoulder 68 of the latch 69 into engagement with the collar 67 of the rod 63, which operation will move the free end of the lever 21 in the same direction to compress the spring 65 and carry the free end of the arm 21^a of said lever inward to bring the clutch-pins 23 into engagement with the clutch-pins 24 of the large gear 8. This engagement will lock the disk 18, gears 16, 8 and 17 together, and, when so locked, the planet pinions will remain stationary. The carriage 1, will now travel rapidly in the direction of arrow *d*, Fig. 1, until the corner of the grinding wheel is opposite the shoulder of the knife, and, when in this position, the trip pin 71 of the arm 70 will break the engagement of the latch 69 with the collar 67, on rod 63, and the spring 65 will actuate the lever 21 and break the engagement of the clutch-pins 23 and 24 and, at the same time, throw the locking-pin 72, which pin is pivotally supported by one end to the lever 21 with its end sliding freely through the standard 73, into engagement with the stop pins 19 of the disk 18. This will hold said disk and gear 16 stationary, while the planet pinions 13 and 14 will revolve about the gears 16 and 17, as the gear 17 has one more tooth than gear 16, the rotation of the shaft 9 will be slower during the grinding operation than when the clutch-pins are engaged for the idle movement of the carriage. When the planet pinions are thus released, the cam 25 will engage the roll 49 to actuate the sliding bar 48—Figs. 1 and 4—to bring its adjusting screw 50 against the arm 46 and return the vertical shaft 42 to bring the roll 44 of the upper arm 43 against the pin 45 of the swinging plate 30 and swing said plate around toward the grinding-wheel to bring the shoulder of the knife blade hard against the corner of said wheel. The large gear 8 runs continuously in the direction of arrow *e*, Fig. 1, and when the clutch-pins are engaged therewith, shaft 9, disk 18, gears 16—17, and cams 25, will rotate with gear 8 and in the same direction for the forward travel of the carriage. But when the clutch-pins are disengaged, the gear 17, shaft 9 and cam 25 will be rotated in the direction of arrow *f* for the return travel of the carriage. As soon as the clutch-pins are disengaged, this movement in the direction of arrow *f* instantly takes effect, and unless means are provided to prevent motion being imparted to the carriage it will begin to move before the swinging plate 30 can carry the knife against the wheel. Therefore, the carriage must stand still long enough to actuate the swinging plate toward the wheel. This is accomplished through the medium of the cut-away portion or recess 27 on the hub 17^a

of the gear 17 so that, said gear will travel idle until the end 27^a of this recess contacts with the projection 29 of the collar 28, which is fixed to the shaft 9. This idle travel of the gear 17 will afford the necessary time for the cam 25 to engage with the roll 49 of the sliding bar 48 and force the adjusting screw 50 of said bar against the lower arm 46, of the vertical shaft 42, and turn said shaft to bring the roll 44, of the upper arm 43, against the pin 45 of the swinging plate 30 and force said plate around toward the grinding wheel. During the idle travel of the gear 17, and while the carriage 1 is in the proper position for the grinding of the knife-blade, it is necessary to hold the carriage stationary until after the swinging plate has been actuated. This is effected by means of the latch 74, Fig. 5 which latch is pivotally supported on the carriage so that, when the carriage is in the position before mentioned, this latch will engage with the projection 47^a of the box 47 and hold said carriage until the bar 48 has been actuated far enough by the cam 25 to effect the lateral movement of the swinging plate, when the adjusting screw 75, carried by said bar, will lift the latch, as shown at Fig. 4, and thus release the carriage. When the knife has been carried past the grinding wheel and the grinding operation has been completed, the arm 70 will engage with the collar 76 of the rod 59 and move said rod sufficiently to withdraw the locking pin 72 from the stop-pins 19 of the disk 18, which operation will allow the gear 8 to run idle and the carriage to stand still.

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

1. In a machine of the character described, in combination, a reciprocating carriage, a support therefor, a laterally movable plate pivotally mounted on the upper surface of the carriage and carrying a knife holder, a grinding wheel, a continuously running shaft, a pinion mounted thereon, a carriage operating shaft, means for operatively connecting said shaft with said carriage, a continuously running gear on said shaft and meshing with the pinion of the driving shaft, and having clutch-pins, planet pinions carried by said gear and journaled on each side thereof, differential gears located on the carriage operating shaft and meshing with the planet pinions, one of said gears secured to said shaft, the other journaled thereon, a disk journaled on said carriage shaft, a sleeve slidably mounted on said shaft, said sleeve having clutch-pins projecting through said disk and the journaled differential gear and adapted to engage with the clutch-pins of the planet carrying gear, means for manually locking said disk, planet carrying gear and the journaled differential

gear together so that they will rotate the carriage operating shaft and the other differential gear for a movement of the carriage in one direction for an accelerated speed, and means for automatically disconnecting the same and locking the disk against rotation for a reverse and slow travel of the carriage, for the purpose set forth.

2. In a machine of the character described, in combination, a reciprocating carriage, a support therefor, a laterally movable plate mounted upon the upper surface of the carriage and pivotally supported at one end of the carriage, and carrying a knife-holder, a grinding-wheel, a driving shaft; a pinion thereon, a carriage operating shaft and means for operatively connecting said shaft with the carriage, automatically reversing and speed reducing mechanism comprising a gear journaled on the carriage shaft; said gear meshing with the driving shaft pinion and carrying planet pinions, differential gears meshing with the planet pinions, one of said gears journaled on the carriage shaft, the other fixed thereto, a disk journaled on the carriage-shaft and provided with means by which it is held against rotation, a sleeve on the carriage shaft and carrying the clutch-pins operatively projecting through the disk and journaled differential gear and adapted to alternately engage with the planet pinion carriage gear, means for manually locking the disk and gears together so that they will rotate with the carriage shaft for an accelerated travel of the carriage in one direction, means for automatically disconnecting the same and locking the disk against rotation for a reverse and slow return travel of the carriage, actuating mechanism for automatically moving the plate toward the grinding wheel, means to effect a temporary stand-still of the carriage operating shaft just before the reverse travel of the carriage begins, and means for automatically returning the plate to its normal position, for the purpose set forth.

3. In a machine of the character described, in combination, a reciprocating carriage, a laterally movable plate mounted upon the upper surface of the carriage and pivotally supported thereon and carrying a knife-holder for supporting a knife, a grinding-wheel, a continuously running driving shaft, a pinion thereon, a carriage operating shaft, and means for connecting it with the carriage, speed reducing mechanism mounted on said carriage shaft and constructed as shown and described, means for manually locking said mechanism together to give an increased and idle travel to the carriage in one direction, means for automatically swinging the plate toward the grinding-wheel to bring the knife in contact therewith, and means for automatically unlocking the carriage shaft mechanism to impart

a reverse and slow travel to the carriage during the grinding operation for the purpose set forth.

4. In a machine of the character described, 5
in combination, the reciprocating carriage 1, a support therefor, laterally movable plate 30 pivotally supported thereon and carrying a knife-holder adapted to support a knife, a grinding-wheel, vertically operating rock-shaft 42 mounted in the carriage, said shaft 10
having arm 43, means for automatically actuating said shaft to swing the plate toward the grinding-wheel through the medium of its arm, and means for disengaging said arm and means for automatically returning said plate to its normal position away from the grinding-wheel, for the purpose set forth. 15

5. In a machine of the character described, 20
in combination, a reciprocating carriage, a pivotally supported knife holder carrying plate mounted thereon, a grinding-wheel, a carriage operating shaft, speed accelerated and automatically reversing and speed reducing mechanism mounted on said shaft, a 25
continuously running driving shaft, means thereon for transmitting motion to the carriage shaft, means for manually locking the mechanism on the carriage shaft for an accelerated travel of the carriage in one direction and while the plate is in its normal position away from the grinding-wheel, means 30
for automatically unlocking said mechanism and reversing the travel of the carriage at a reduced speed; means for automatically swinging the plate toward the grinding wheel, temporary means for preventing the reverse movement of the carriage until after 35
a knife is brought against the grinding-wheel, means for automatically checking the 40

travel of the carriage after a knife has been ground, and means for automatically returning the plate to its normal position, for the purpose set forth.

6. In a machine of the character described, 45
a reciprocating carriage, a knife holder mounted thereon, a grinding wheel, a carriage operating shaft directly connected with the carriage, speed accelerating and automatically reversing and speed reducing 50
mechanism mounted on said shaft, for the purpose set forth.

7. In a machine of the character described, a knife holder; a grinding wheel, a reciprocating carriage, a continuously running driving 55
shaft, a pinion thereon, a carriage operating shaft having journaled thereon speed accelerating and automatically reversing and speed reducing mechanism comprising the gears 8, 16, 17 and disk 18 journaled on 60
the carriage operating shaft, gear 8 meshing with the pinion of the driving shaft and carrying planet pinions meshing with the gears 16 and 17, endwise movable sleeve 20 65
carrying clutch pins, means on gear 8 for locking said pins thereto so that when said pins are locked to the gear 8 the gears 8, 16, 17 and disk 18 will be locked together for a rapid travel of the carriage, means, when the 70
said pins are disconnected from the gear 8, for holding the disk stationary for a slow travel of the carriage, for the purpose set forth.

Signed at Bridgeport in the county of Fairfield and State of Connecticut this 15th 75
day of Sept. A. D. 1906.

CHARLES L. JOY.

Witnesses:

GEO. D. PHILLIPS,
GEO. W. FINN.