

E. KOLB.
 PENCIL COUNTING MACHINE.
 APPLICATION FILED JULY 22, 1913.

1,099,705.

Patented June 9, 1914.

3 SHEETS—SHEET 1.

Fig. 1.

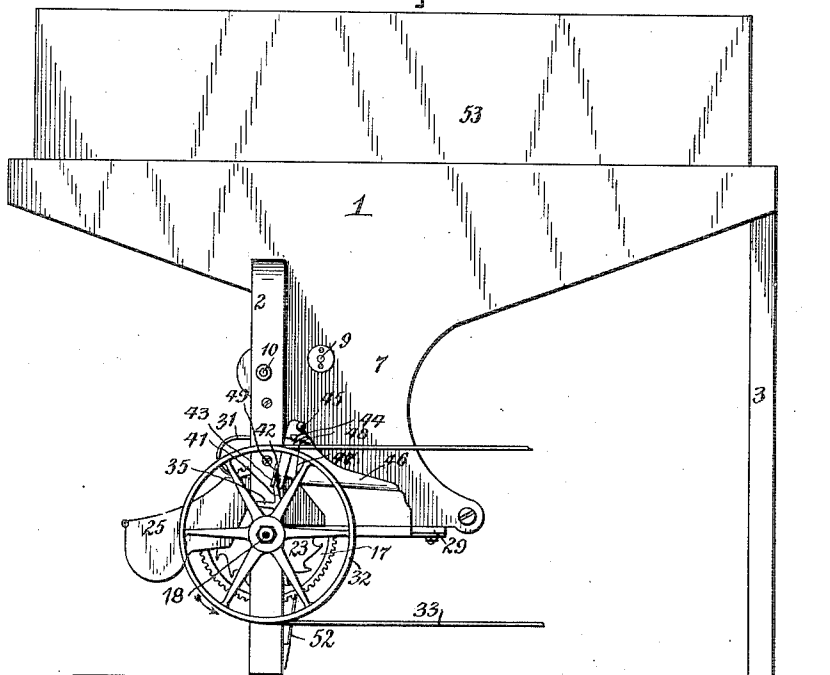


Fig. 2.

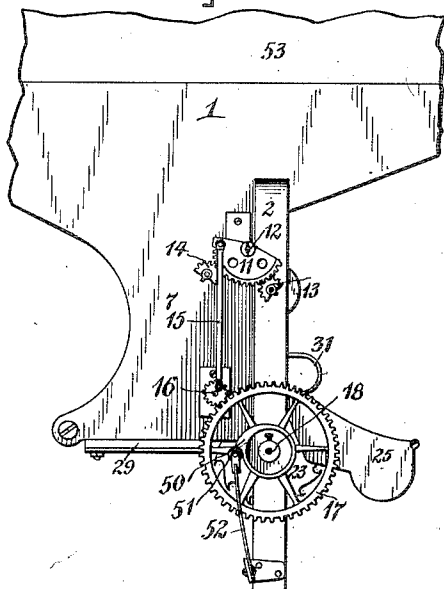
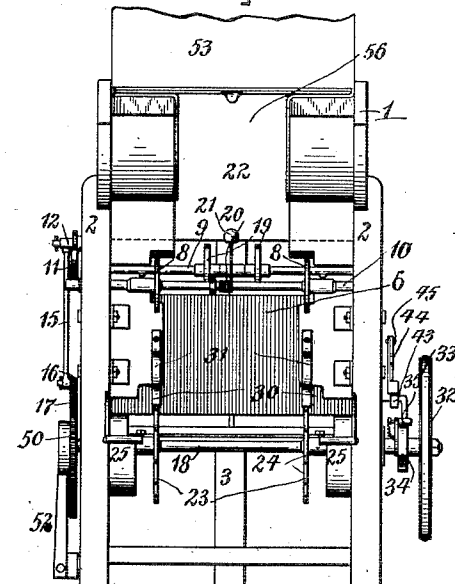


Fig. 3.



WITNESSES

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3 SHEETS—SHEET 2.

Fig. 4.

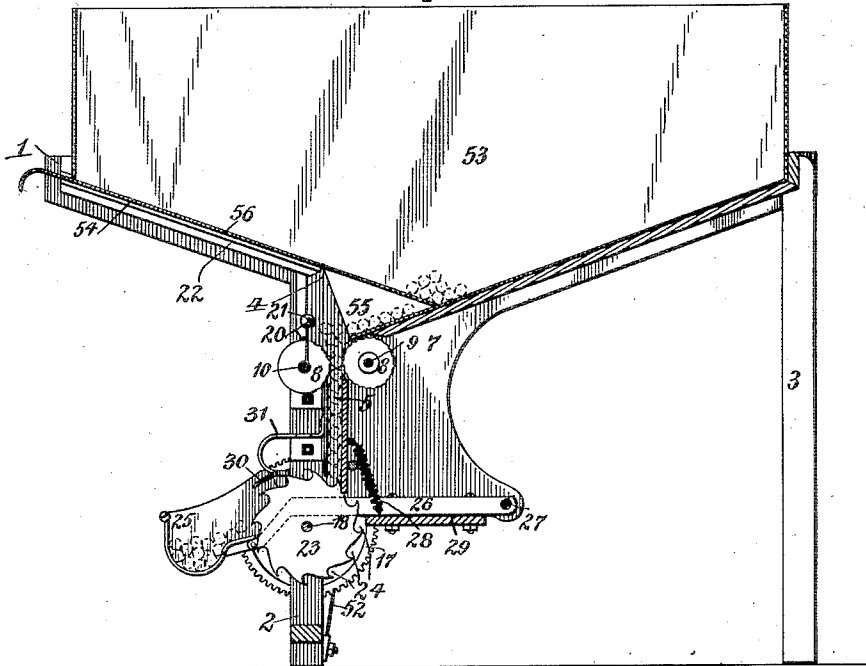
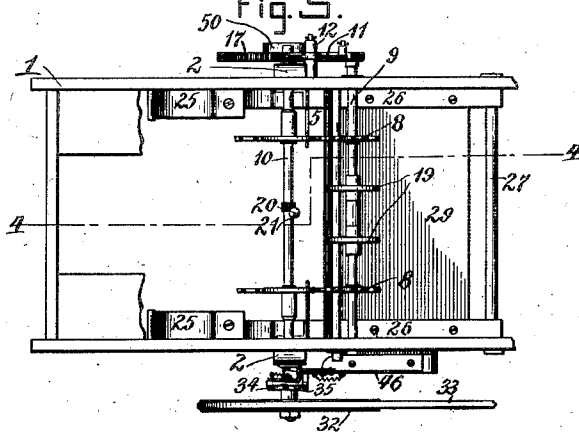


Fig. 5.



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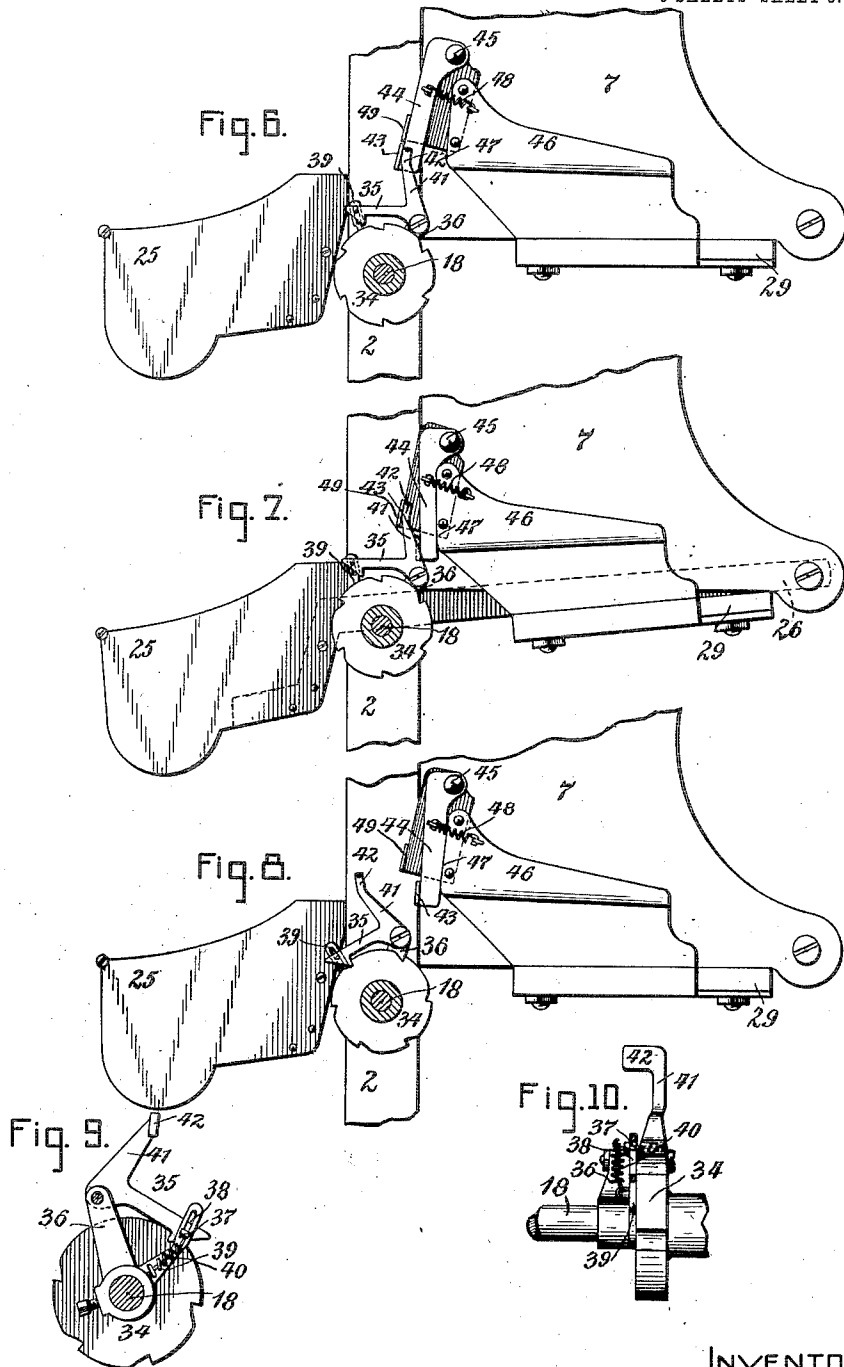
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3 SHEETS—SHEET 3.



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EDWARD KOLB, OF LOCKPORT, NEW YORK.

PENCIL-COUNTING MACHINE.

1,099,705.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, EDWARD KOLB, a citizen of the United States, residing at Lockport, in the county of Niagara and State of New York, have invented new and useful Improvements in Pencil-Counting Machines, of which the following is a specification.

This invention relates to a machine designed more especially for automatically counting lead pencils, but it may be used for counting other articles of similar dimensions.

It is customary among pencil manufacturers to wrap pencils in packages each containing a dozen and to place a greater or less number of such packages in boxes of suitable size. The counting of the pencils is ordinarily done by hand, which is a comparatively slow operation requiring a large number of operatives.

The object of my invention is the provision of a simple, durable and compact machine which will count the pencils in a reliable and expeditious manner.

In the accompanying drawings: Figure 1 is a side elevation of a machine embodying the invention. Fig. 2 is a fragmentary side elevation thereof viewed from the side opposite that shown in Fig. 1. Fig. 3 is a front view of the machine. Fig. 4 is a vertical longitudinal section thereof on lines 4-4, Fig. 5. Fig. 5 is a top plan view of the same with a portion of the hopper-bottom broken away to expose the parts beneath. Figs. 6, 7 and 8 are enlarged sectional side elevations of the clutch-mechanism and the movable pencil receiver controlling the same, showing different positions of the parts. Fig. 9 is an enlarged inside view of said mechanism. Fig. 10 is a view of said mechanism at right angles to Fig. 9.

Similar characters of reference indicate corresponding parts throughout the several views.

1 indicates a main feed hopper which receives the pencils or other articles to be counted, which latter are placed crosswise in the hopper. In the construction shown, the hopper is mounted on a pair of rear legs or standards 2 and a front standard 3.

4 indicates the outlet of the hopper which extends from side to side thereof, and 5 a substantially vertical chute arranged to receive the pencils from the outlet. The length of this chute from side to side is co-

extensive with the width of the hopper, while the width of the chute from front to back is just sufficient to freely receive a single row of pencils. As shown at 6 in Fig. 3, the front wall of the chute is slotted centrally or cut away to expose the pencils therein to the view of the operator and enable him to straighten or remove any of the pencils in case the chute should become clogged from any cause. The closed sides of the chute are formed by downward extensions 7 of the side walls of the hopper.

Suitable devices for feeding the pencils one at a time to the chute and for straightening them before entering it, are preferably employed. The feed devices shown in the drawings comprise a number of pairs of opposing feed wheels 8 arranged between the discharge opening of the hopper and the mouth of the chute and at the front and rear sides of the latter. The wheels preferably have roughened or corrugated edges, as shown. The front and rear sets of wheels are properly spaced to admit the descending pencils between them without marring the pencils, and the two sets are respectively mounted on horizontal front and rear shafts 9 and 10 supported transversely in the standards 2 and the hopper walls 7. These shafts are rocked or oscillated in opposite directions by any appropriate mechanism, that shown in the drawings, Figs. 2, 3 and 5, comprising an oscillating gear segment 11 journaled on a stud 12 carried by the hopper, and a pair of segmental pinions 13 and 14 meshing with said segment. The latter is connected by a rod 15 with the wrist pin of a gear pinion 16 which meshes with a large gear wheel 17 secured to the main shaft 18 of the machine. By the oscillating movement thus imparted to the opposing feed wheels, the pencils on entering between the same are alternately lifted and dropped, thus agitating them and causing them to roll freely into the chute and fall straight one upon another. In addition to these feed wheels, one or more auxiliary or pencil straightening wheels 19 may be employed. These auxiliary wheels are mounted loosely on the front shaft 9 between the corrugated feed wheels 8 carried by the same shaft, as shown in Figs. 3 and 5. By this provision, should a number of pencils become crossed or assume a more or less oblique position in approaching or passing over said corrugated wheels, they will be momentarily sup-

ported on one or the other of said loose and relatively-stationary wheels and the mass of pencils behind those crooked pencils will by their weight straighten them, delivering them in that position to the feed wheels and by the latter into the chute 5.

To further insure the delivery of the pencils to the chute in a straight position, a flail or beater 20 is preferably employed which is adapted to strike the exposed central portions of the pencils as they arrive above the mouth of the chute, thereby jarring or agitating them and tending to straighten any that may be more or less crooked. In the construction shown, this flail consists of an elastic or spring-arm secured to the rear rock shaft 10 and carrying a ball 21 which vibrates through a longitudinal slot 22 in the bottom of the hopper.

Arranged at the bottom of the chute 5 are a number of upright, rotary counting devices or wheels 23 secured side by side upon the main shaft 18, as shown. The machine illustrated in the drawings has two of such wheels arranged under opposite ends of the chute but a different number may be used, if desired. Each of these wheels is provided in its periphery with equidistant article-receiving seats or notches 24, corresponding to the number of articles to be counted by the machine at a time, the wheels having a dozen when used for counting pencils, as shown. The seats of the two counting wheels are arranged in horizontal alignment to support and carry the pencils in a level position or parallel with the shaft of said wheels. In the preferred construction shown, the edges of the counting wheels are notched in the form of ratchet teeth and the spaces between them are curved or concave to form the pencil-seats.

Located on the delivery side of the counting wheels is a pencil receiver or receptacle which in the construction shown consists of a pair of separated U-shaped pockets 25 which receive the end portions of the counted pencils, leaving their intermediate portions free to be grasped by the operator in removing them. These receiver-pockets are carried by the rear ends of vertically-movable arms 26 pivoted at their opposite ends upon a transverse rod 27 supported by the wall-extensions 7. A spring 28 serves to yieldingly hold these arms and the receiver-pockets in their normal elevated position. This spring is secured at its upper end to the front of the chute 5 and at its lower end to a cross piece 29 connecting the arms 26.

30 indicates a pair of yieldable stop-fingers respectively arranged adjacent to the upper edges of the counting wheels 23 to prevent the thirteenth pencil or the first of the succeeding batch from being released and thrown into the receiver 25 by centrifugal force when said wheels are stopped

after the delivery of the twelfth pencil as hereinafter described. The shanks or arms 31 of these stop-fingers are preferably in the form of wide loops, so that in case a pencil should become disarranged after leaving the chute it can be readily withdrawn from the counting wheels.

The main shaft 18 is adapted to be automatically thrown out of gear with its driving mechanism after the machine has counted a dozen or other predetermined number of pencils or other articles, and to be again thrown into gear with the driving mechanism preferably by depressing the pencil-receiver 25 in the act of removing the counted batch of pencils therefrom. The preferred mechanism shown in the drawings for this purpose is constructed as follows: Loosely mounted on the projecting end of the driving shaft 18 is a driving wheel or pulley 32 to which power may be transmitted by a belt 33 or other suitable means. To the hub of this pulley is fixed one member of a clutch which consists of a notched or ratchet disk 34, while the adjacent portion of the driving shaft carries the other clutch member which consists of a hook or pawl 35 pivoted to an arm 36 secured to said shaft. At its hooked end this pawl carries a pin 37 which projects laterally into a longitudinal slot 38 formed in an arm 39 secured to the main shaft, as shown in Figs. 9 and 10. The pawl is yieldingly held in engagement with the clutch disk by a spring 40 connecting its pin 37 with the arm 39. Extending upwardly from the hub of the pawl is a trip arm 41 having a laterally-projecting lug 42 adapted to strike a similar lug 43 of a movable stop or arm 44 after the main shaft and the counting wheels 23 have made one complete revolution. At its upper end this stop arm is pivoted by a transverse pin 45 to a bracket 46 located on the outer side of the hopper 1 and carried by the adjacent receiver-arm 26, so as to rise and fall with the receiver. The stop arm 44 is constantly urged toward a shoulder 47 of the bracket 46 by a spring 48, in which position the lug 43 of said arm stands in the rotary path of travel of the lug 42 of the trip arm 41, as shown in Fig. 8. Arranged on the front side of said stop arm and projecting into its path of movement is a fixed stop or lug 49 carried by the bracket 46.

50 indicates a cam secured to the main shaft 18, preferably on the outer side of the gear wheel 17 and 51 indicates a roller engaging the cam and carried by a spring arm 52 secured to the adjacent standard 2. These parts cooperate with the clutch as hereinafter described.

If desired the pencils to be counted may be placed directly in the hopper 1, but preferably a number of interchangeable supple-

mental hoppers are used in conjunction therewith, one of which is shown at 53. This supplemental hopper may be made of sheet metal, such as tin and is removably seated in the main hopper. It has straight walls and a sloping bottom conforming to the corresponding parts of the main hopper. The rear portion of its bottom has a central longitudinal slot 54 corresponding to that of the main hopper, and it has an outlet 55. The latter and the slot 54 may be closed by a slide 56. In the use of the machine, a supplemental hopper with its slide closed is filled with pencils, said hopper is placed in the main hopper as shown in the drawings, and the slide 56 is then withdrawn, allowing the pencils to escape through the outlet 55 and enter between the feed wheels 8 and 9. By the use of such supplemental hoppers, one can be filled by an attendant while the other is being emptied by the machine, and the empty hopper can be quickly replaced by the filled one.

The operation of the machine is as follows: The pulley 32 and the clutch disk 34 are constantly driven in the direction of the arrow. When the pencil-receiver 25 is in its normal elevated position and the trip arm 41 of the clutch-pawl 35 is clear of the stop lugs 43 and 49, as shown in Fig. 8, the pawl is allowed to engage the clutch disk, transmitting motion from the driving pulley to the main shaft 18, rotating the counting wheels 23 and actuating the feed wheels 8 and 9 and the flail 20. Upon now placing a supplemental hopper 53 filled with pencils into the main hopper 1 and withdrawing the slide 56, the pencils are successively fed into the chute 5 by the feed wheels as hereinbefore described. As the twelve seats of the rotating counting wheels successively pass by the delivery end of the chute they each receive a single pencil, the pencils being carried rearwardly past the spring fingers 30 and dropped into the receiver 25. Immediately after the counting wheels have made a complete revolution and consequently counted a dozen pencils and dropped them into the receiver, the trip lug 42 of the clutch pawl encounters the movable stop lug 43 and swings the stop-arm 44 against the fixed stop 49, as shown in Fig. 6, thereby arresting said movable stop arm which in turn acts as a positive stop or abutment. As the carrying arm 36 of the pawl continues to rotate with the main shaft 18, the trip arm 41 is swung backward, lifting the pawl out of engagement with the clutch disk, as shown in Fig. 6, throwing the main shaft out of gear with the driving pulley 17 and stopping the counting wheels and other parts actuated by said shaft. The cam 50 and spring pressed roller 51 aid in effecting the prompt disengagement of the clutch pawl from the clutch disk and insure an accurate count of

each batch of pencils delivered into the receiver. For this purpose, the parts are so arranged that the highest part of the cam passes said roller just as the pawl begins to recede from the clutch disk. The roller-spring 52 by its reaction gives the cam and the shaft 18 a slight forward impulse and as the pawl-carrying arm 36 is secured to said shaft, this action results in withdrawing the pawl from said disk with certainty. After the machine has counted and dropped twelve pencils into the receiver, the operator grasps the batch and at the same time presses them downward to depress the receiver, after which he removes the counted batch of pencils, thus allowing the receiver to return to its elevated position under the action of its spring 28. The vibration of the pencil receiver in the act of removing the counted batch of pencils results in re-engaging the clutch pawl 35 with the clutch disk 34, causing the machine to count and deliver another dozen of pencils, this operation being repeated every time the operator removes a batch of pencils from the receiver. This reengaging action of the clutch pawl will be understood from an inspection of Figs. 6 and 7. On depressing the pencil receiver, the aligned fixed and movable stops 43 and 49 descend with it, causing the lower movable stop lug 43 to slide downward out of engagement with the lug 42 of the trip arm and allowing it to snap back to the position shown in Fig. 7, while the fixed stop 49 follows and takes the former place of the pivoted stop, the fixed stop moving down in front of the lug of said trip arm before the pivoted stop clears it, thus continuing to hold the clutch pawl out of engagement with the clutch disk, as shown in Fig. 7. On the upward stroke of the pencil receiver, said fixed stop rises out of engagement with the lug of the trip arm 41, releasing the latter and allowing the pawl to reengage the clutch disk under the action of its spring 40, as shown in Figs. 8 and 9, thereby again actuating the counting wheels and counting and delivering another batch of pencils.

By so organizing the machine that the operation of the counting wheels is under the control of the operator, the machine delivers the counted batches of pencils no faster than the operator can remove and pack them, avoiding the liability of producing a congestion of pencils in the receiver and an inaccurate count of the same.

In order to obtain the best results, it is desirable to locate the chute 5 forwardly out of line with the axis of the counting wheels, so as to bring the delivery end of the chute over the front or receiving side of said wheels where the position of their seats is such as to allow but a single pencil to escape from the chute at a time. This ar-

5 rangement of the chute is especially desirable in connection with article seats having the form of ratchet teeth as shown, inasmuch as the rear sides of the seats in passing the delivery end of the chute assume a more or less inclined position, insuring the deposit of a single pencil at a time into each seat.

10 Various modifications may obviously be made in the machine within the scope of the appended claims, and I do not therefore wish to be limited to the particular construction herein shown and described.

I claim as my invention:

15 1. In a machine of the character described, the combination of a feed hopper, oscillatory feed wheels arranged at opposite sides of the outlet of the hopper, means for actuating said wheels, and counting mechanism arranged to receive the articles after passing the feed wheels.

20 2. In a machine of the character described, the combination of a feed hopper, a chute, opposing feed devices arranged between the outlet of the hopper and the mouth of the chute, means for oscillating said feed devices, and counting mechanism arranged to receive the articles after passing the chute.

30 3. In a machine of the character described, the combination of a feed hopper, a pair of transverse shafts arranged at opposite sides of the hopper-outlet, opposing feed wheels mounted on said shafts, means for oscillating said shafts, and counting mechanism arranged to receive the articles after passing said wheels.

35 4. In a machine of the character described, the combination of a feed hopper, a pair of transverse shafts arranged at opposite sides of the hopper-outlet and each having a gear pinion, an oscillating gear engaging both of said pinions, means for actuating said gear, opposing feed wheels mounted on said shafts, and counting mechanism arranged to receive the articles after passing said wheels.

45 5. In a machine of the character described, the combination of a feed hopper, feed wheels arranged at opposite sides of the hopper-outlet, means for rotating said wheels, an article-straightening wheel arranged adjacent to said feed wheels, and counting mechanism arranged to receive the articles after passing said feed wheels.

50 6. In a machine of the character described, the combination of a feed hopper, transverse shafts arranged at opposite sides of the hopper-outlet, opposing feed wheels fixed to said shafts, an article-straightening wheel mounted loosely on one of said shafts, and counting mechanism arranged to receive the articles after passing said feed wheels.

60 7. In a machine of the character described, the combination of a feed hopper, transverse shafts arranged at opposite sides

of the hopper-outlet, and each carrying a plurality of feed wheels, an article-straightening wheel loosely mounted on one of said shafts between the feed wheels thereof, and counting mechanism arranged to receive the articles after passing said feed wheels. 70

8. In a machine of the character described, the combination of a feed hopper, counting mechanism, feed mechanism arranged between the hopper-outlet and the counting mechanism, a rock shaft arranged adjacent to said outlet, and a beater mounted on said shaft and adapted to agitate the articles in the hopper. 75

9. In a machine of the character described, the combination of a rotary counting device having article-seats, means for actuating said device, means for automatically arresting said counting device after delivering a predetermined number of articles, and a supply-chute having its discharge end arranged out of line with the axis of the counting device and above its receiving side. 80

10. In a machine of the character described, the combination with a main feed hopper and counting mechanism arranged to receive the articles therefrom, of a supplemental hopper removably fitted in said main hopper and having an opening in its bottom and a slide applied to said opening, and counting mechanism arranged to receive the articles after passing said supplemental hopper. 85

11. In a machine of the character described, the combination with a main feed hopper having a longitudinal slot in its bottom narrower than the length of the articles to be counted, a supplemental hopper removably fitted in said main hopper and having an outlet corresponding to the outlet of the main hopper and a longitudinal slot corresponding to the slot of the main hopper, a slide applied to the slot of the supplemental hopper, and counting mechanism arranged to receive the articles after passing the supplemental hopper. 90

12. In a machine of the character described, the combination of a movable counting device, means for actuating said device, and a movable receiver for the counted articles controlling said actuating means. 95

13. In a machine of the character described, the combination of a movable counting device, means for actuating said device, automatic means for disconnecting the counting device from said actuating means after the counting of a predetermined number of articles, and manually-controlled means for connecting the counting device with said actuating means. 100

14. In a machine of the character described, the combination of a movable counting device, means for actuating said device, automatic means for disconnecting said 105

counting device from said actuating means after counting of a predetermined number of articles, a movable receiver for the counted articles, and means controlled by said receiver for connecting the counting device with said actuating mechanism.

15. In a machine of the character described, the combination of a movable counting device, driving mechanism for said device, a clutch for throwing the counting device into and out of gear with said driving mechanism, automatic means for disconnecting the members of said clutch after the counting of a predetermined number of articles, a movable receiver for the counted articles, and means controlled by said receiver for reengaging said clutch members.

16. In a machine of the character described, the combination of a movable counting device, driving mechanism for said device, a clutch for throwing the counting device into and out of gear with said driving mechanism, automatic means for disconnecting the members of said clutch after the counting of a predetermined number of articles, a movable receiver for the counted articles, and means carried by said receiver and controlling the reengagement of said clutch members.

17. In a machine of the character described, the combination of a movable counting device, means for driving the same, and a depressible receiver for the counted articles controlling said driving means.

18. In a machine of the character described, the combination of a rotary counting wheel, means for delivering articles thereto, driving means therefor, a clutch for throwing said wheel into and out of gear with said driving means, one member of said clutch having a trip device, a movable receiver for the counted articles, and stop-means movable with said receiver and arranged to stand in the path of said trip device in the elevated position of the receiver and to release said trip device when the receiver is actuated.

19. In a machine of the character described, the combination of a rotary counting wheel, means for delivering articles thereto, driving means therefor, a clutch for throwing said wheel into and out of gear with said driving means, one member of said clutch having a trip device, a movable receiver for the counted articles, a pair of stops carried by the receiver and cooperating with said trip device, one of said stops being fixed and the other movable relatively thereto and adapted to abut against the same, the fixed stop being arranged to clear said trip-device in the normal position of the receiver and the movable stop to stand in the path of the trip device.

20. In a machine of the character described, the combination of a rotary counting wheel, means for delivering articles thereto, driving means therefor, a clutch for throwing said wheel into and out of gear with said driving means, one member of said clutch having a trip device, a movable receiver for the counted articles, and a spring for normally withdrawing the movable stop from the fixed stop.

21. In a machine of the character described, the combination of a rotary shaft, a counting wheel mounted thereon, means for delivering articles to said wheel, a driving member for said wheel, a clutch-disk carried by the driving member, a cooperating clutch pawl carried by the counting wheel shaft and having a trip arm, a receiver for the counted articles pivoted to swing at right angles to the counting-wheel shaft, a pair of cooperating stops movable with the receiver, one of said stops being fixed and the other pivoted in rear thereof and adapted to abut against the same, and a spring tending to withdraw the movable stop from the fixed stop, the fixed stop being arranged to clear said trip arm in the elevated position of the receiver and to stand in its path in the depressed position of the receiver, and said movable stop being arranged in the path of said trip arm in the elevated position of the receiver and to stand below and clear thereof in the depressed position of the receiver.

22. In a machine of the character described, the combination of a feed device, a counting wheel having peripheral seats arranged to receive the articles from the feed device, and an elastic stop-finger arranged adjacent to the edge of the counting wheel.

23. In a machine of the character described, the combination of a counting wheel, driving means therefor, and a movable receiver for the counted articles controlling said driving mechanism, said receiver comprising a pair of separated pockets adapted to receive the end portions of the articles.

24. In a machine of the character described, the combination of a shaft carrying a counting wheel, a driving means for said shaft, a clutch comprising a disk connected with said driving means and a cooperating clutch-pawl carried by said shaft, and automatic means for disengaging said pawl from said disk, including a cam mounted on said shaft and a spring pressed member engaging said cam.

Witness my hand this 17th day of July, 1913.

EDWARD KOLB.

Witnesses:

EDWIN B. JELLEY,
C. F. GEYER.