July 13, 1926.

1,592,796

E. P. WEBSTER

CARTON FEEDING MEANS

Filed Feb. 6, 1925

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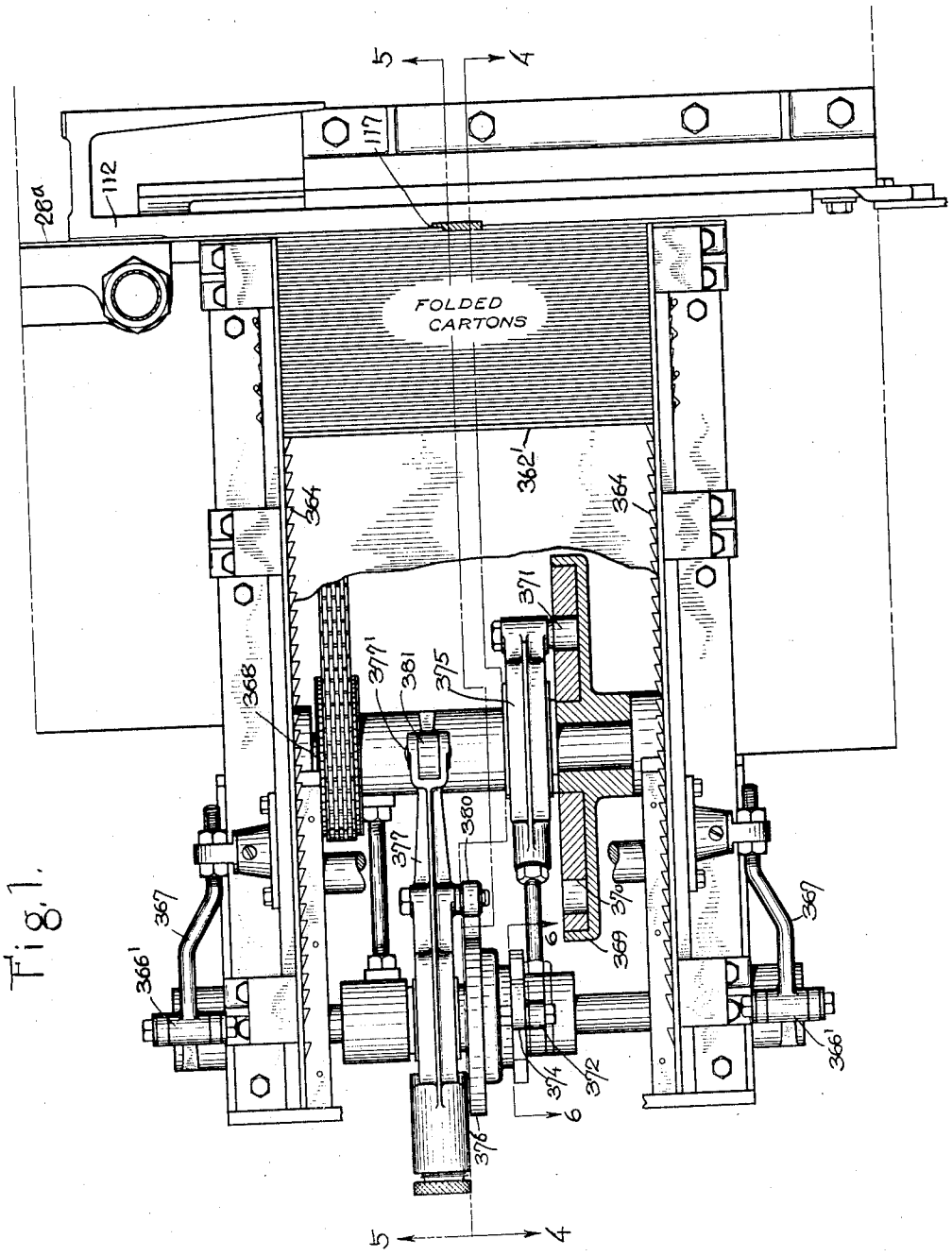


Fig. 1.

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5 Sheets-Sheet 2

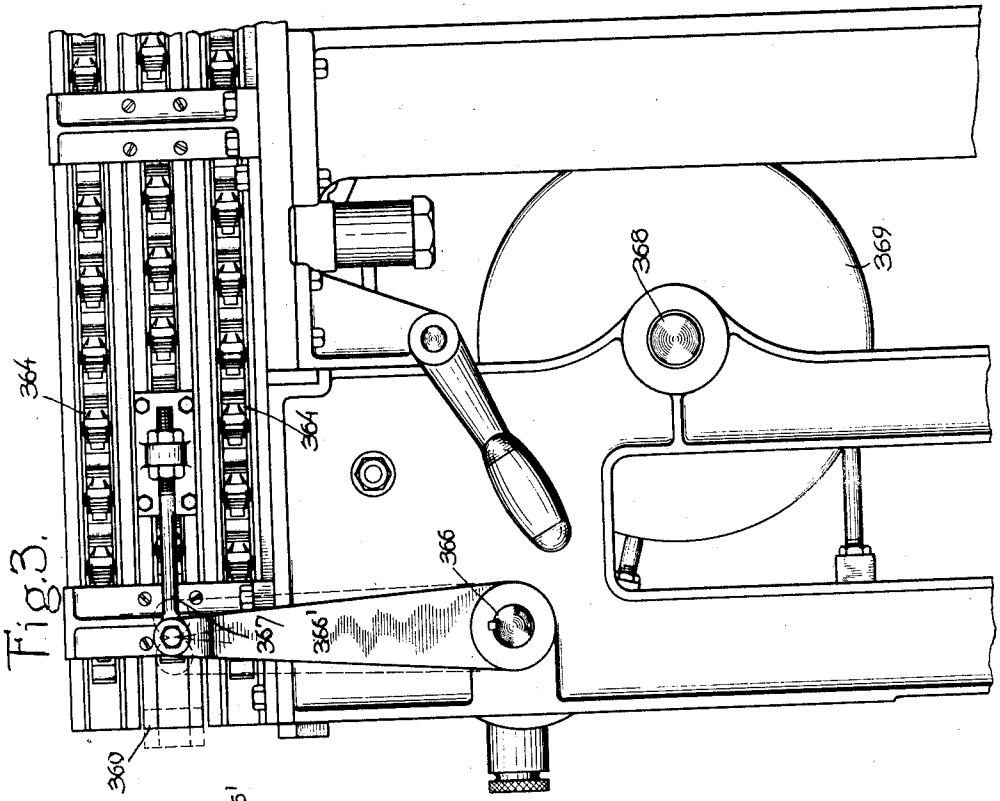


Fig. 3.

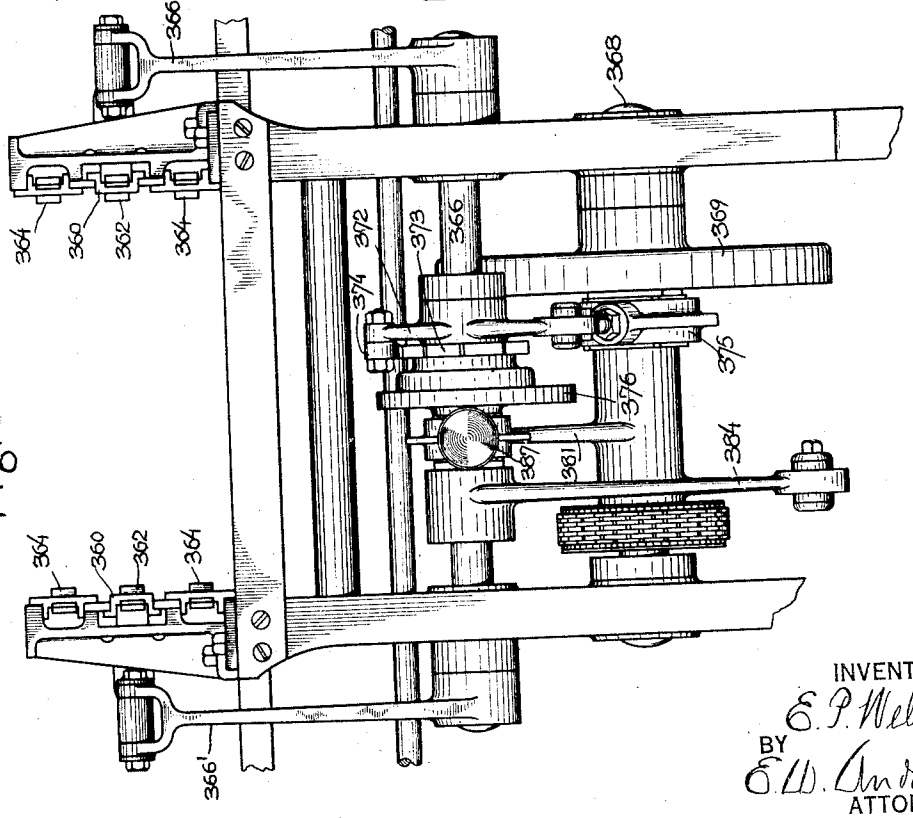


Fig. 2.

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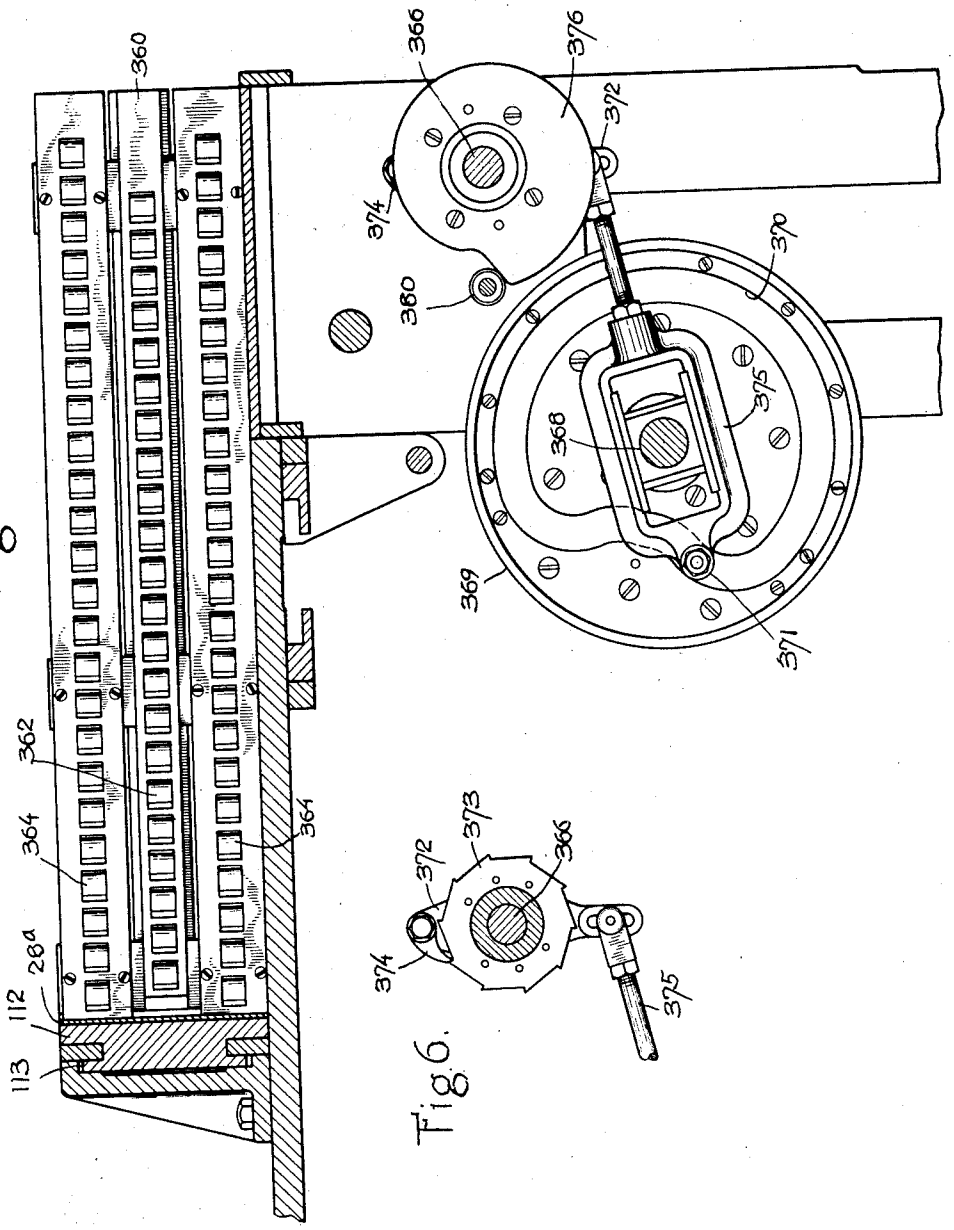


Fig. 4.

Fig. 6.

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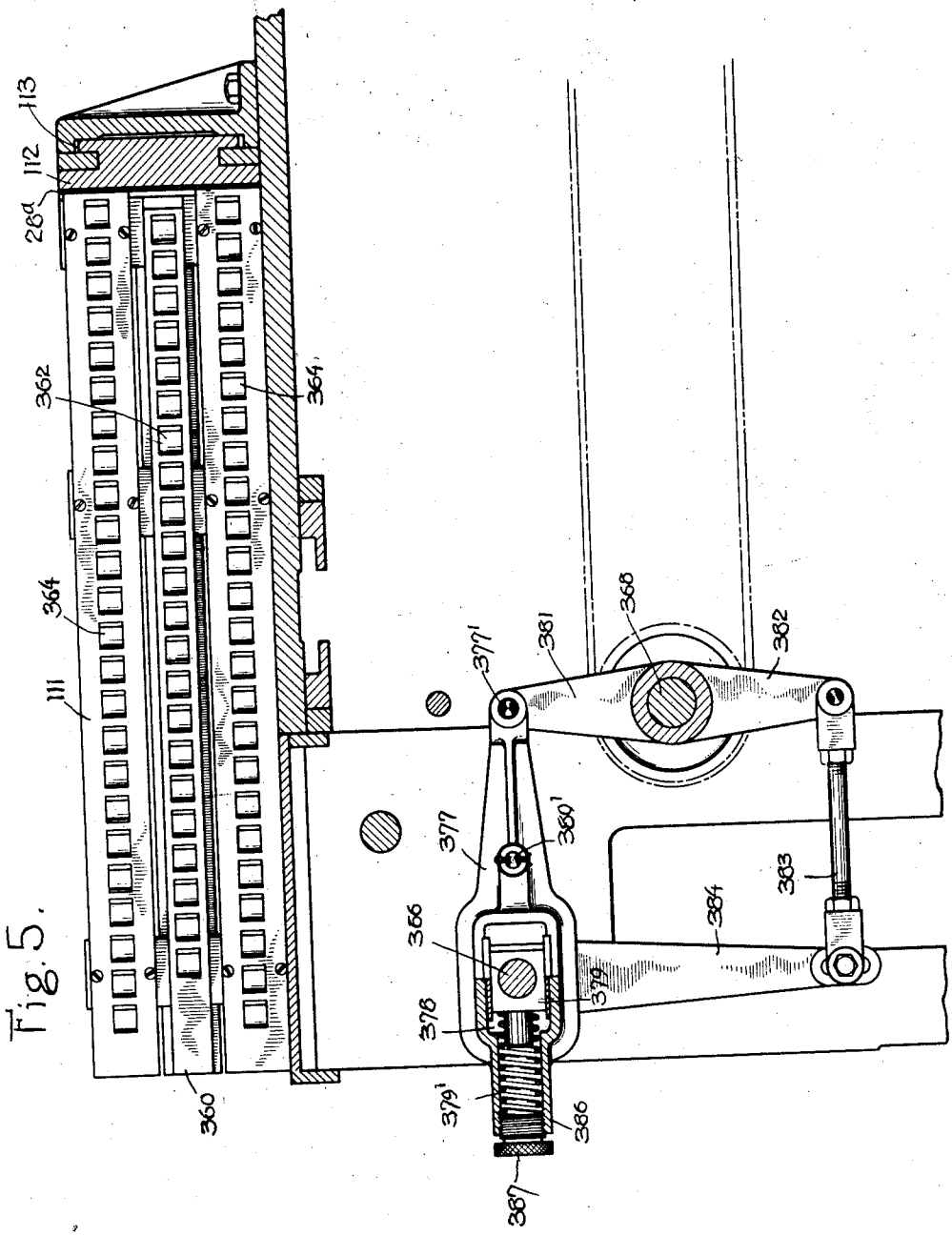


Fig. 5.

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CARTON FEEDING MEANS

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Fig. 7.

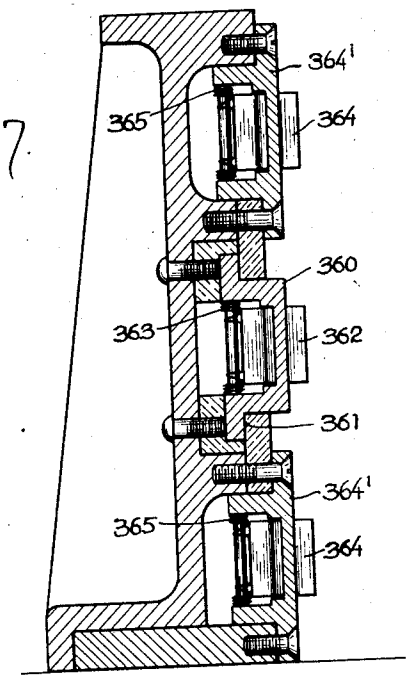


Fig. 8.

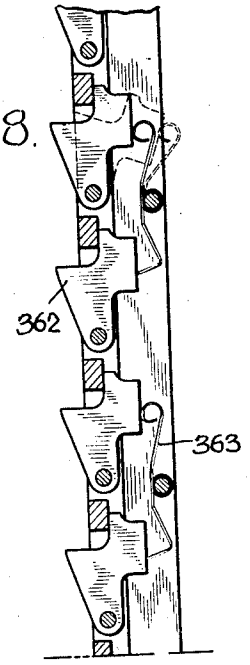


Fig. 9.

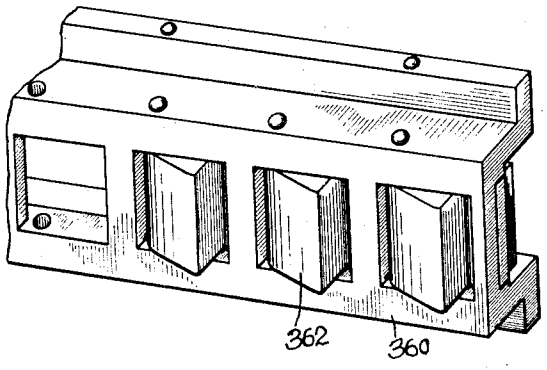
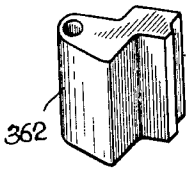


Fig. 10.



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Patented July 13, 1926. 1,592,796

UNITED STATES PATENT OFFICE.

EARL P. WEBSTER, OF NIAGARA FALLS, NEW YORK, ASSIGNOR TO THE SHREDDED WHEAT COMPANY, OF NIAGARA FALLS, NEW YORK, A CORPORATION OF NEW YORK.

CARTON-FEEDING MEANS.

Application filed February 6, 1925. Serial No. 7,413.

This invention relates to machines for preparing cartons for the introduction of articles therein, the cartons being fed to the machine in flattened form and opened by suitable devices for the reception of the contents. More particularly, the present invention has to do with the mechanism by which the folded cartons may be advanced one by one to the means by which they are opened and placed in condition for further use.

The mechanism of the present invention is arranged to receive a stack of cartons in collapsed condition and this stack is advanced with a step by step movement through a hopper. At the end of the hopper at each operation of the device one of the cartons is withdrawn for delivery to the opening devices and as the stack is exhausted, additional cartons are inserted through the rear end of the hopper and are advanced with those in front. The mechanism includes feeding devices which engage the stack and advance it with a step by step movement through a succession of steps, these devices then returning in a single step to their original position, and also holding means for preventing the backing up of the stack of cartons during the retractile movement of the feeding devices.

For a better understanding of the invention, reference will be made to the accompanying drawings, in which—

Figure 1 is a plan view of the invention.

Figure 2 is an end view of the same.

Figure 3 is a partial side view of the same.

Figure 4 is a section on the line 4—4, Figure 1.

Figure 5 is a section on the line 5—5, Figure 1.

Figure 6 is a detail section on the line 6—6, Figure 1.

Figure 7 is a detail vertical section through one side wall of the hopper.

Figure 8 is a detail horizontal section through a part of one side wall of the hopper.

Figure 9 is a detail perspective view of a fragment of one of the toothed strips.

Figure 10 is a detail perspective view of one of the teeth.

In these drawings, which illustrate one embodiment of the invention, the numeral 111 designates the hopper in which the cartons 28ª are massed in horizontal series against the outer side of a reciprocatory head 112 working in a guideway 113. Upon the forward stroke of the head 112, the endmost carton engaged at one vertical edge thereon by the shoulder 117 of a recess 116 of said head, will be moved to a position out of register with the mass of cartons in the hopper, the cartons being in this manner removed one by one from the hopper, and said head having an operating connection 114 with the lever 140ᵈ.

The cartons are fed longitudinally of the hopper 111 intermittently step by step, each step of movement a distance equal to the thickness of a flattened carton, by means of reciprocatory toothed strips 360, working in guideways 361, and the teeth 362 of which are held outwardly by springs 363, these teeth being yieldable against the tension of the springs. The strips are advanced with a step by step movement forwardly through a succession of steps and are then returned to their original position in a single step, these forward and backward movements being repeated indefinitely throughout the operation of the machine.

The cartons are held against backward movement in the hopper during the return movement of the toothed strips 360 by upper and lower horizontal series of spring acting teeth 364, also held outwardly by springs, designated 365, the teeth being yieldable against the tension of said springs. The upper and lower series of teeth 364 and the springs 365 thereof are carried each series by a longitudinal strip or plate 364′, detachably secured to the hopper framing by bolts or screws. The toothed strips 360 are also detachably secured to the hopper framing and are located centrally of the upper and lower horizontal series of teeth 364, both the former and the latter being located at the sides of the hopper. The teeth 362 engage a back plate 362′ in rear of the charge of cartons to equalize the pressure thereon in feeding the same.

By providing separate means for feeding the cartons and holding them against backward movement, and by placing the holding and feeding means in the sides of the hopper, successive charges of the cartons may easily be inserted into the hopper through the open end thereof without interfering with the feeding of the stack or charge already in place. The feeding means has a

forward movement in steps of a predetermined length, and the teeth for holding the cartons against backward movement are spaced a similar distance. When a new charge of cartons is to be placed in position, the cartons are inserted into the hopper from the rear and moved forwardly against the rear face of the back plates 362′ until the hopper is loaded, when a duplicate back plate 362′ is pushed in behind the cartons, the first named back plate being removed after the hopper teeth have engaged said duplicate plate. The teeth 362 and 364 yield against the tension of their springs in the insertion of the charges of cartons and spring back in rear of the charge, those of said teeth located laterally opposite the cartons being thereby held pressed outwardly.

The strips 360 are connected by links 367 with arms 366′ fast on a rock shaft 366. On this shaft is a ratchet wheel 363, the teeth of the ratchet being engaged by a pawl 374 on a lever 372 loosely fulcrumed on shaft 366. A cam disc 376 is mounted loosely on the shaft 366 but is secured to the ratchet wheel so that as the ratchet wheel is advanced, the cam is rotated with a step by step movement. This rock lever 372 is connected to a yoke 375 which straddles a drive shaft 368, the yoke carrying a roller 371 entering a cam slot 370 in a cam disc 369 mounted on the shaft 368. As the cam disc 369 is rotated by drive shaft 368, it rocks lever 372 and causes the ratchet wheel 373 to be rotated with a step by step movement.

Secured to the shaft 366 is an arm 384 connected by a link 383 with one arm 382 of a rock lever 381 loosely fulcrumed on drive shaft 368. The other arm of the lever is connected at 377′ to a yoke 377 which carries a pin 380′ on which is mounted a roller 380 bearing against the surface of the cam disc 376. The yoke 377 has a slot 378 in which is received a bearing block 379 of rock shaft 366 and a coil spring 379′ disposed in an extension of the yoke at one end encircles a pin on the bearing block and at the other bears against an adjustment screw 287 mounted in the end of the extension 386.

With the arrangement described, it will be seen that as the cam 369 on drive shaft 368 is rotated, it brings about a step by step movement of the cam 376. The position assumed by the roller 380 in contact with the surface of the cam 376 determines the position that will be assumed by the rock shaft 366, and the parts are so arranged that the rock shaft will cause the strips 361 to be advanced to feed the cartons forwardly in the hopper with a step by step movement, and after a succession of such steps the roller 380 will drop off the high point of cam 376 abruptly and the strips 361 will be moved backwardly in a single step. From this position the strips are again moved forwardly in short steps.

I claim:—

1. In carton feeding means, a hopper for the cartons, means for feeding the cartons longitudinally of the hopper, means for automatically moving the feeding means with a step by step movement in feeding direction and returning the said means to the first position in a single step, and means for holding the cartons against backward movement in the hopper.

2. In carton feeding means, a hopper for flattened cartons, spring acting means for feeding the cartons longitudinally of said hopper, and independent spring acting follow up means for holding the cartons against backward movement as fed.

3. In carton feed means, a hopper for flattened cartons, toothed spring acting means for feeding the cartons longitudinally of said hopper, and independent toothed spring acting follow up means for holding the cartons against backward movement as fed.

4. In carton feeding means, a hopper for flattened cartons, toothed spring acting means located marginally of the hopper for feeding the cartons longitudinally thereof, and independent toothed spring acting follow up means located longitudinally along both sides of the hopper for holding the cartons against backward movement as fed.

5. In carton feeding means, a hopper for the cartons, a member reciprocating lengthwise of the hopper and carrying means for engaging the cartons, positive means for moving the member with a step by step movement in one direction and restoring the member to its original position in a single step, and independent follow-up means for preventing the backward movement of the cartons in the hopper.

6. In carton feeding means, a hopper for flattened cartons, spring acting means for engaging and feeding the cartons longitudinally of the hopper, means for moving the spring acting means with a succession of steps in the feeding direction and with a single step to original position, and independent follow-up means for holding the cartons against backward movement as fed.

7. In carton feeding means, a hopper for flattened cartons, intermittently operated spring acting means located longitudinally along both sides of the hopper for feeding the cartons a distance equal to the thickness of a flattened carton for each step of movement, and independent follow up means for holding the cartons against backward movement as fed.

8. In carton feeding means, a hopper for flattened cartons, intermittently operating spring acting means located longitudinally along both sides of the hopper for feeding the cartons a distance equal to the thickness

of a flattened carton for each step of movement, and independent spring acting follow up means located longitudinally along both sides of the hopper for holding the cartons against backward movement as fed.

9. In carton feeding means, a hopper for flattened cartons, intermittently operating toothed spring acting means located longitudinally along both sides of the hopper for feeding the cartons a distance equal to the thickness of a flattened carton for each step of movement, and independent spring acting follow up means located longitudinally along both sides of the hopper for holding the cartons against backward movement as fed.

10. In carton feeding means, a hopper for the cartons, a member movable to advance the cartons in the hopper, and positive means for moving the member forwardly in a series of steps and for restoring the member to its original position in a single step.

11. In carton feeding means, a hopper for the cartons, a member reciprocating in a plane lengthwise of the hopper and carrying means for engaging the cartons, and positively acting means for moving the member forwardly with a step by step movement and for restoring the member to its original position in a single step.

12. In carton feeding means, a hopper for cartons, a member mounted in a defining wall of the hopper and carrying means for engaging the cartons, means for positively advancing the member with a step by step movement in a direction to feed cartons from the hopper and for positively restoring the member to its original position in a single step, and independent follow-up means for holding the cartons against backward movement in the hopper.

13. In carton feeding means, a hopper for flattened cartons, intermittently operating reciprocatory means for feeding the cartons longitudinally of the hopper including a rotary cam and means for operating the same intermittently, and independent follow up means for holding the cartons against backward movement as fed.

14. In carton feeding means, a hopper for flattened cartons, means for feeding the cartons longitudinally of the hopper including a slidable reciprocatory toothed strip at each side of the hopper the teeth of which are spring acting and means for moving said toothed strips intermittently, and independent follow up means for holding the cartons against backward movement as fed.

15. In carton feeding means, a hopper for flattened cartons, means for feeding the cartons longitudinally of the hopper including a slidable toothed strip at each side of the hopper the teeth of which are spring acting and means for moving said toothed strips intermittently, and independent follow up means for holding the cartons against backward movement as fed.

16. In carton feeding means, a hopper for the cartons, a strip disposed at each side of the hopper and carrying means for engaging the cartons, means for moving the strips intermittently including a rock shaft, and means for positively turning the rock shaft in one direction in a succession of steps and for restoring the rock shaft to its original position in a single step.

17. In carton feeding means, a hopper for flattened cartons, means for feeding the cartons longitudinally of the hopper including a slidable reciprocatory toothed strip at each side of the hopper and means for moving the toothed strips intermittently including a rock shaft, a drive shaft, a cam grooved disk upon the drive shaft, a roller working in said groove, a lever loosely fulcrumed upon said rockshaft, a ratchet wheel loose upon said rock shaft, a pawl carried by said lever and engaging said ratchet wheel, said roller having an operating connection with said lever, a cam loose upon said rock shaft and fast to said ratchet wheel, a reciprocatory yoke arm having a roller engaged by said cam and a lever loosely fulcrumed upon said drive shaft and pivoted to said reciprocatory arm and having an operating connection with said rock shaft, and independent follow up means for holding the cartons against backward movement as fed.

In testimony whereof I affix my signature.

EARL P. WEBSTER.