

June 29, 1954

S. J. CAMPBELL
INFEED CONVEYER, PARTICULARLY DESIGNED
FOR USE IN WRAPPING MACHINES

2,682,331

Original Filed Feb. 27, 1946

6 Sheets-Sheet 1

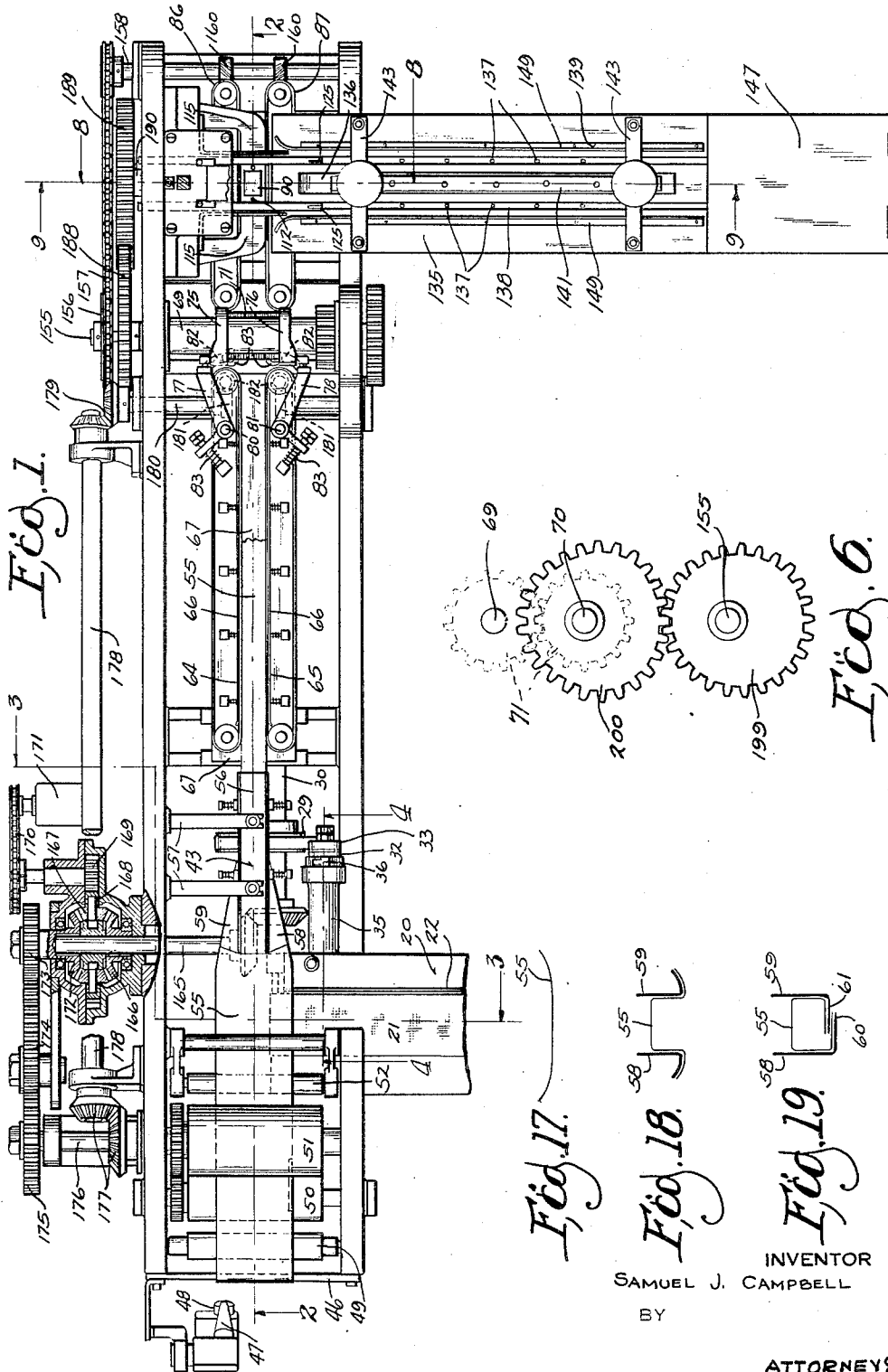


Fig. 17.

Fig. 18.

Fig. 19.

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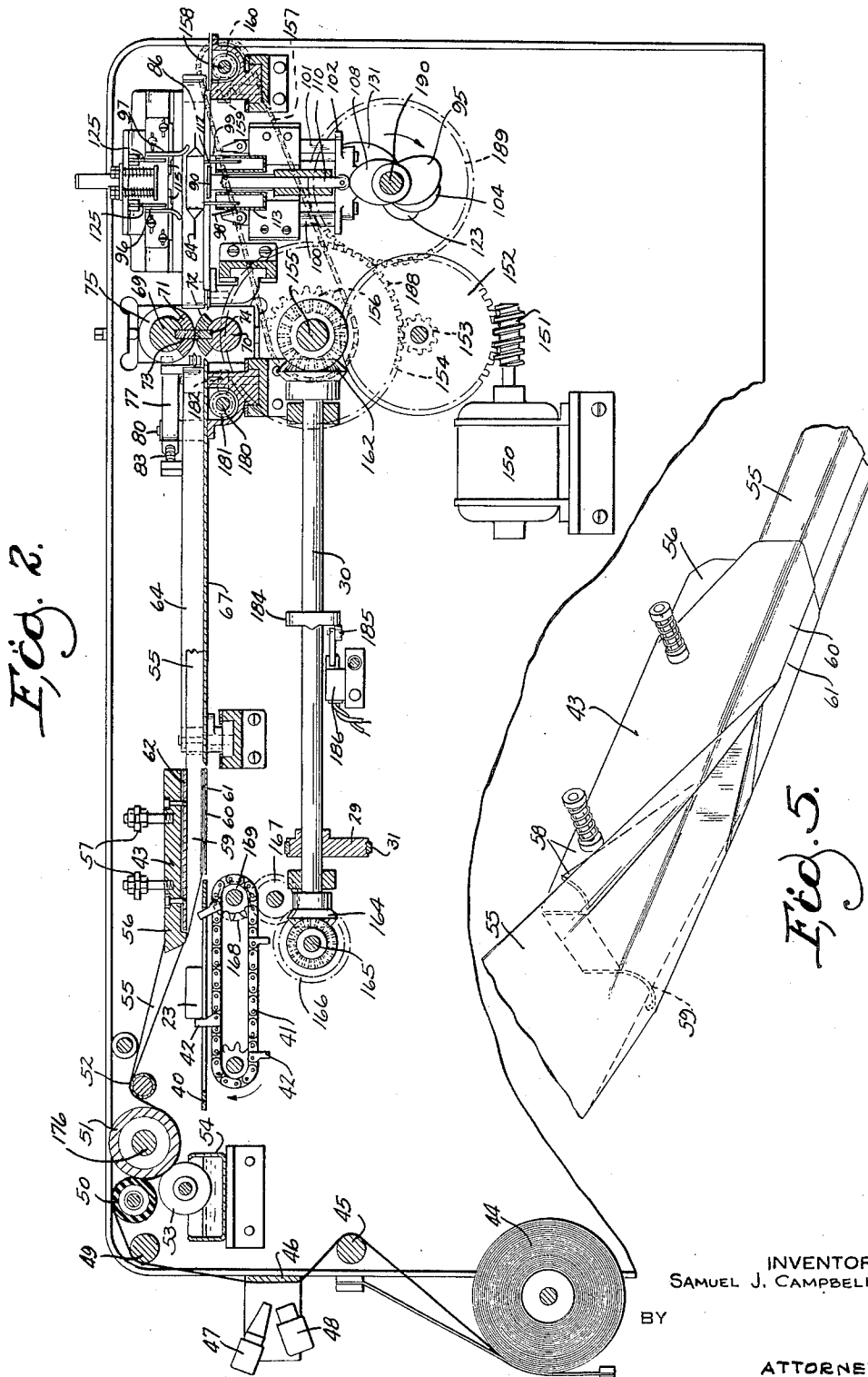
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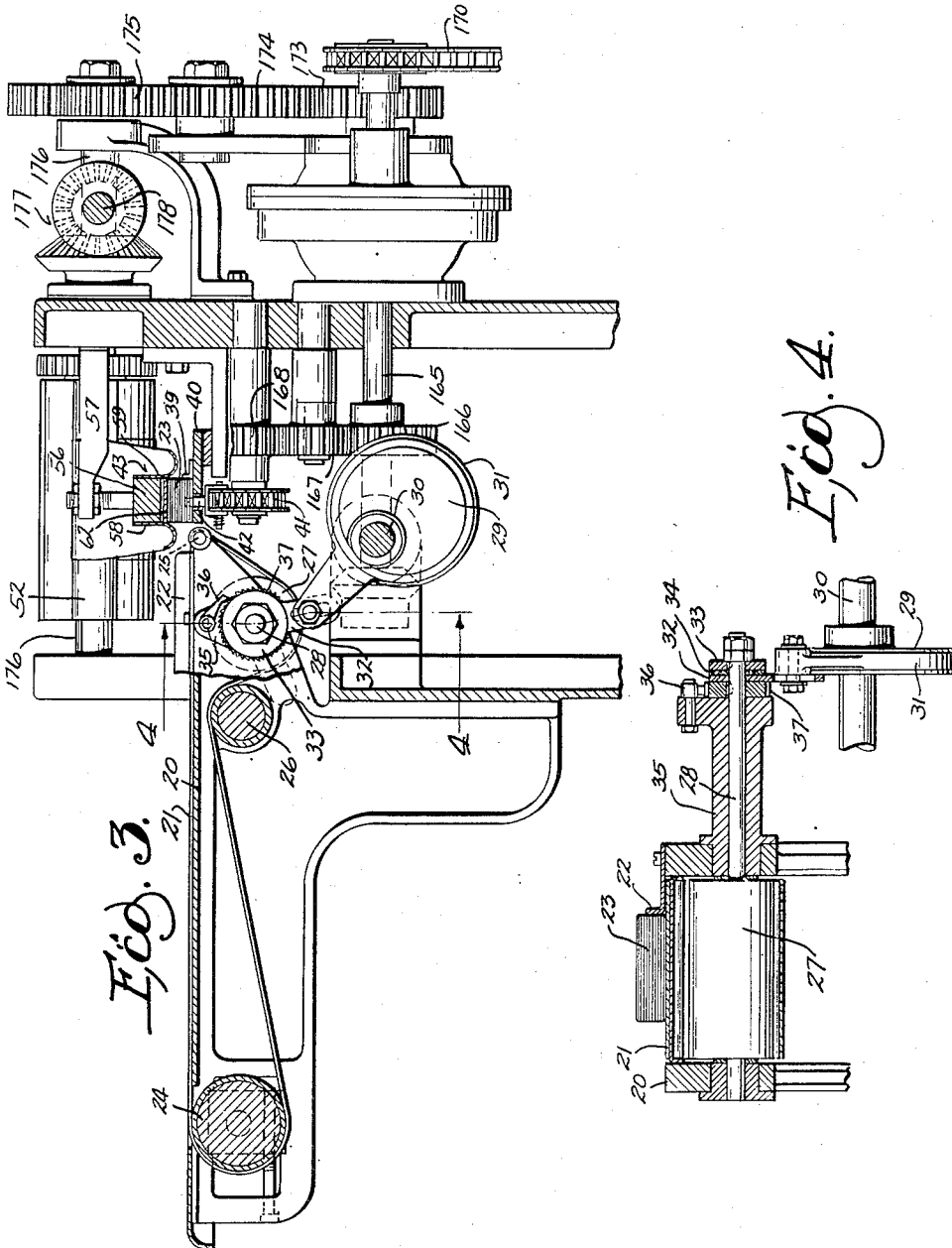
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Fig. 8.

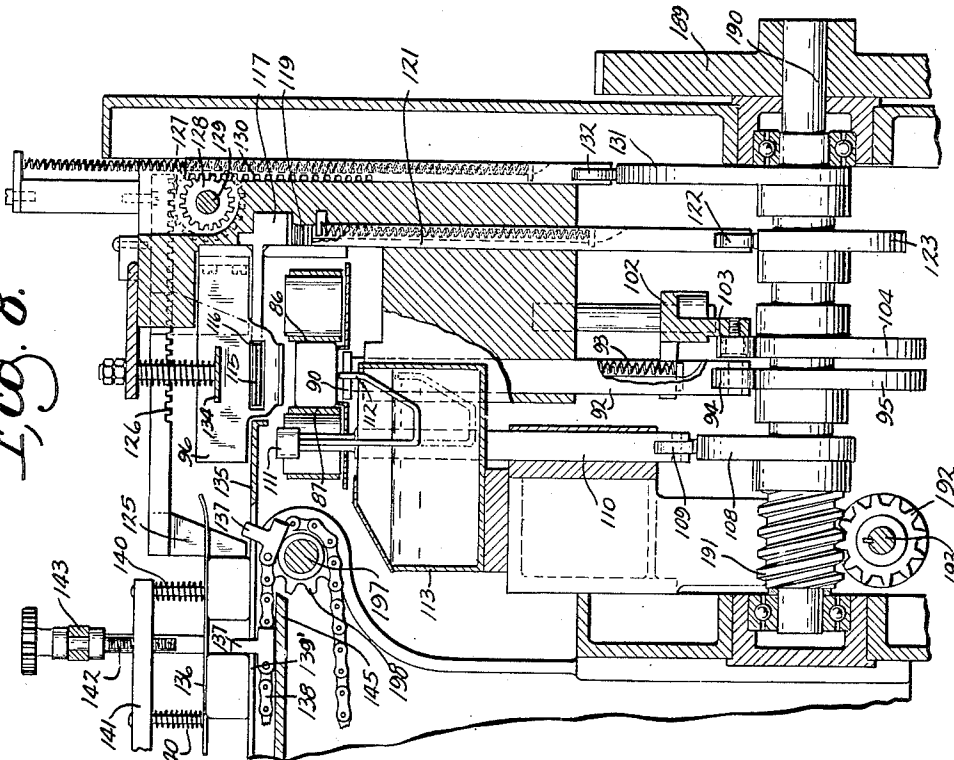
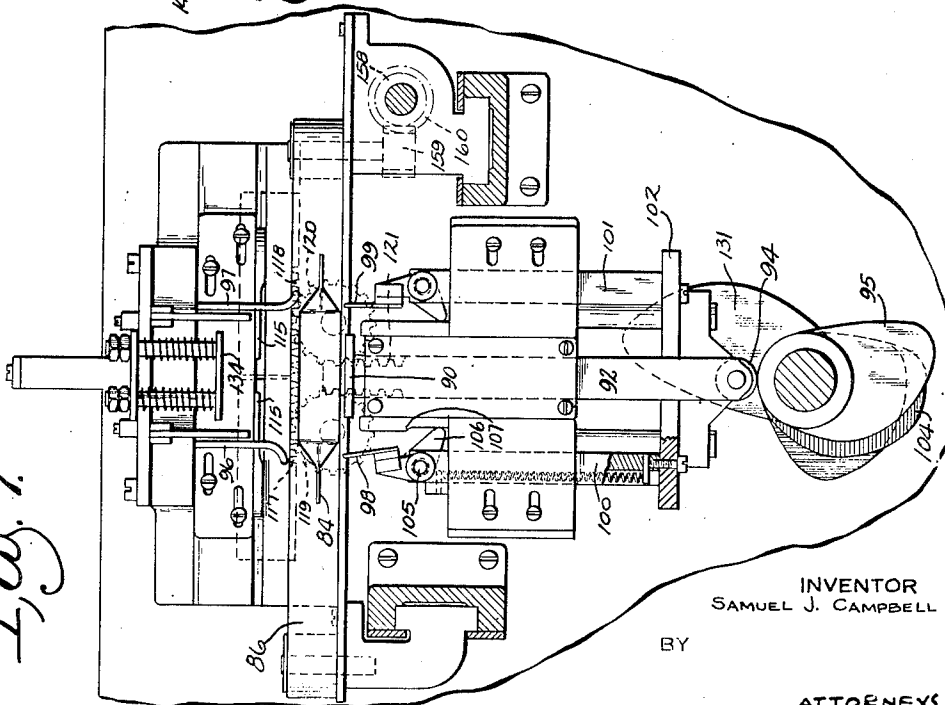


Fig. 7.



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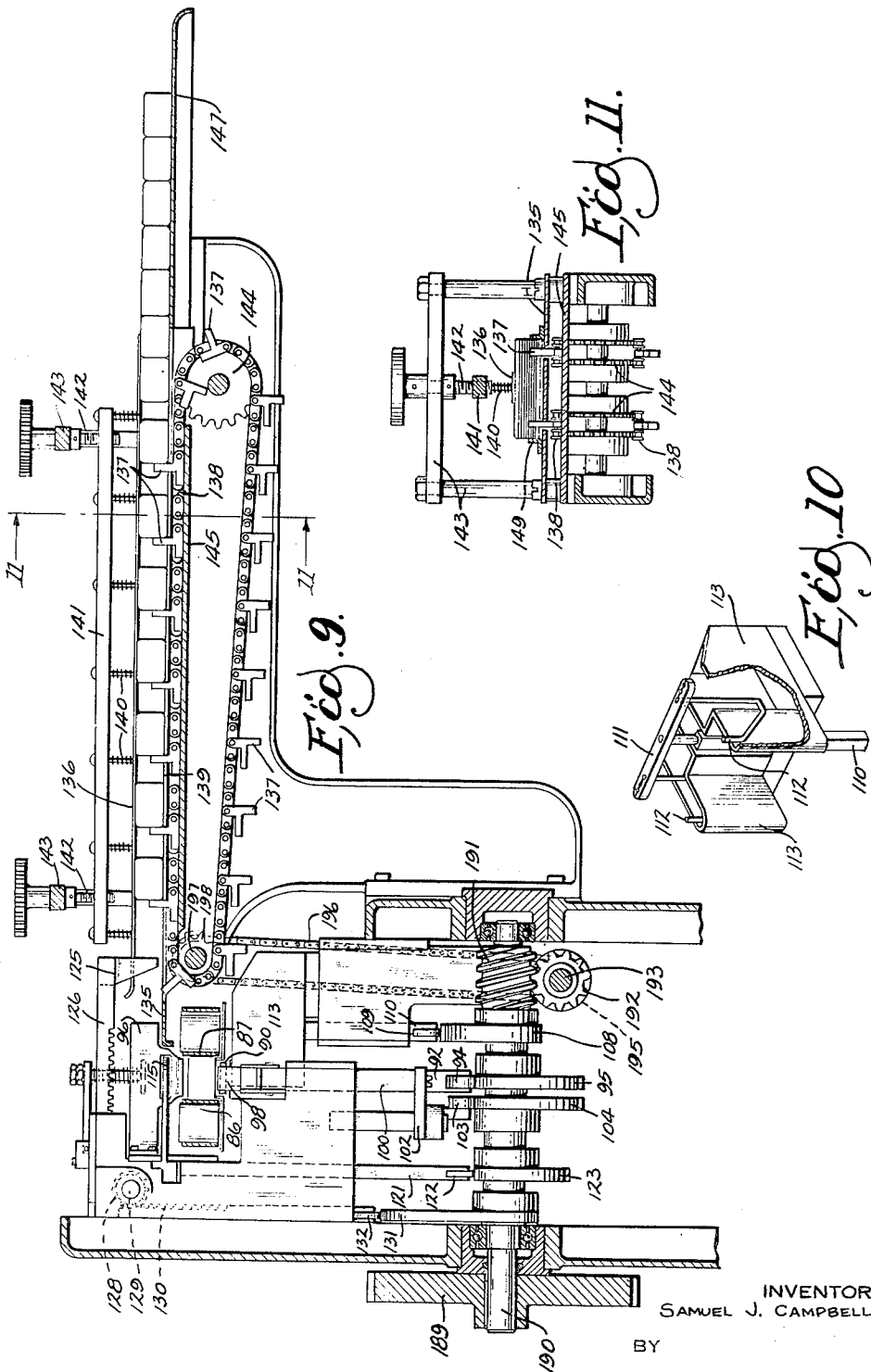
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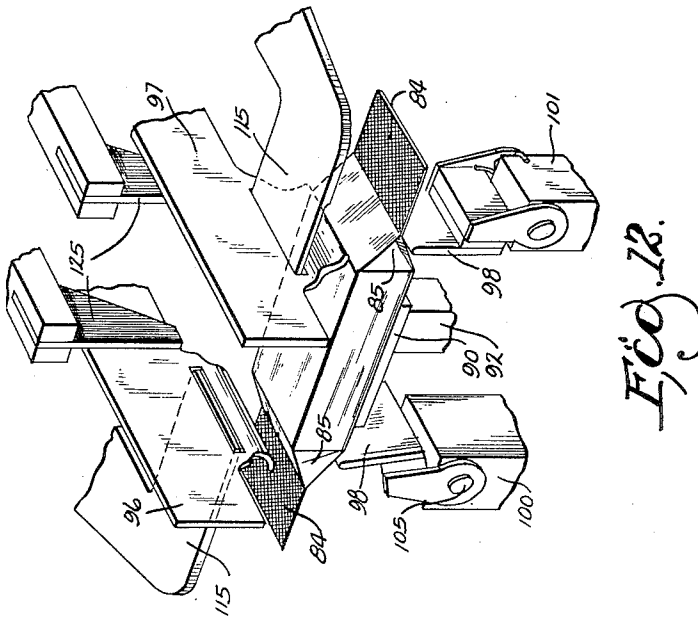


Fig. 12.

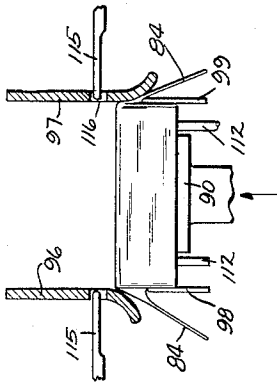


Fig. 14.

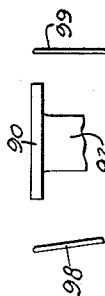
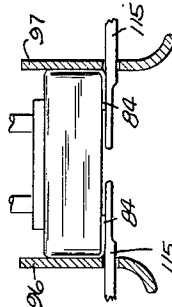


Fig. 16.

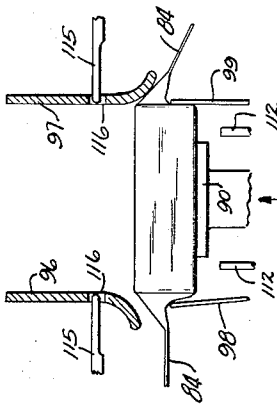


Fig. 13.

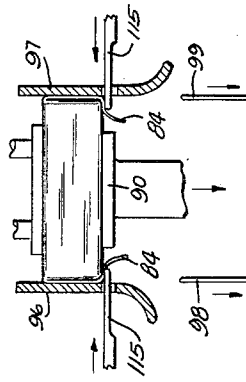


Fig. 15.

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INFEED CONVEYER, PARTICULARLY DESIGNED FOR USE IN WRAPPING MACHINES

Samuel J. Campbell, Green Bay, Wis.

Original application February 27, 1946, Serial No. 650,593, now Patent No. 2,602,276, dated July 8, 1952. Divided and this application January 2, 1952, Serial No. 264,612

10 Claims. (Cl. 198—102)

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This invention relates to an infeed conveyor particularly designed for use in wrapping machines. The present application is a division of my application 650,593, entitled "Wrapping Machines" and filed February 27, 1946, now Patent 2,602,276 granted July 8, 1952.

There is a conveyor system which delivers successive workpieces into a channel wrapper in order that the wrapper may be folded about the workpieces to entube them. To this conveyor system, which has means for positively engaging each workpiece so that they will move into the machine in properly synchronized relationship, the successive workpieces are delivered laterally by another conveyor which acts impositively upon them and which, in each operation, advances through a range sufficient for the delivery of a workpiece from its end and then has a lesser retrogressive movement to withdraw successive workpieces from contact with the workpiece thus delivered.

In the drawings:

Fig. 1 is a plan view of a candy wrapping machine embodying the invention, portions of which are broken away.

Fig. 2 is a view taken in section on the line 2—2 of Fig. 1.

Fig. 3 is a view taken in section on line 3—3 of Fig. 1.

Fig. 4 is a view taken in section on line 4—4 of Fig. 1.

Fig. 5 is a detail view showing in bottom perspective the folder otherwise best illustrated in Fig. 2 for entubing the web of wrapping material about the article to be wrapped.

Fig. 6 is a detail view in front elevation of gears for operating the crimping and cut-off mechanism.

Fig. 7 is an enlarged detail view taken on substantially the same section as Fig. 2.

Fig. 8 is a detail view at right angles to the section of Fig. 7 and taken in section substantially on the line 8—8 of Fig. 1.

Fig. 9 is a view in side elevation of discharge end of the machine, portions thereof being broken away to the section indicated at 9—9 in Fig. 1.

Fig. 10 is a view fragmentarily illustrating in perspective the glue pot and gluer employed to effect a seal of the wrapper ends following the end fold.

Fig. 11 is a detail view taken in section on the line 11—11 in Fig. 9.

Fig. 12 is an enlarged diagrammatic view in perspective showing the apparatus used to complete the end fold.

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Figs. 13, 14, 15, and 16 are transverse sectional views diagrammatically illustrating successive positions of the parts used in completing the end fold.

Figs. 17, 18 and 19 are diagrammatic transverse sectional views through the wrapper web and the tubing former in the successive positions of the web indicated in Fig. 1.

The candy bars or other work to be wrapped are assembled manually on the infeed table 20 on which there is exposed a belt conveyor 21 partially lapped by a guide 22 against which the several work pieces 23 are butted, as shown in Fig. 4.

Belt 21 is guided over idler pulleys 24, 25 and 26 and a driving pulley 27 having a shaft 28 arranged to receive intermittent motion from the eccentric 29. This eccentric is mounted on a rotating shaft 30 and provided with an eccentric strap 31 connected to an oscillating plate 32 apertured to receive the shaft 28. At the end of the shaft is friction clutch member 33 having a friction facing 34 bearing on the oscillating plate 32. The fixed bracket 35 for the shaft 28 carries a pawl 36 which engages the teeth of a ratchet wheel 37 carried by shaft 28 to prevent any retrogressive movement of such shaft. Thus the frictional bearing between the oscillatory plate or disk 32 and the clutch member 33 rotates the shaft clockwise, as viewed in Fig. 3, during each rotation of the eccentric 29, but the shaft is precluded by the pawl 36 from partaking of the counterclockwise oscillation of plate 32.

In each intermittent advance of the belt 21, one of the work pieces 23 is discharged from the belt on to the slotted conveyor plate 43 beneath which the propelling chain 41 operates in a direction longitudinally of the work piece. The conveyor chain 41 has one or more propelling lugs 42 which, projecting through the slot in plate 40, engage each successive work piece to advance it longitudinally beneath the entubing apparatus generally indicated at 43.

It is important that the conveyor belt 21 advance each successive work piece 23 into full registration with the propelling chain 41 which is to advance it longitudinally. At the same time, it is very important that before the longitudinal advance of the work piece commences, clearance should be established between this work piece and the next consecutive work piece on the belt 21. Otherwise, in the case of a candy bar the friction between the work pieces would abrade the coating of the bar and, what is perhaps more important, it would be true of any work piece that contact between successive work pieces would tend to

displace the work piece on the conveyor and prevent it from feeding properly into the wrapping web as hereinafter described.

Accordingly, I provide at 39 a positive stop in the form of an angle iron against which the work piece 23 is delivered by the thrust of the belt 21 and I make the throw of eccentric 29 sufficiently great to assure that the work piece will be seated firmly against the stop 39. The spacing between the teeth of the ratchet wheel 37 is slightly less than the arc through which such ratchet wheel is advanced by the throw of eccentric 29, whereby, during the reverse oscillation of the frictional driving plate 32, a slight retrogressive movement of the ratchet wheel 33, shaft 28, pulley 27 and belt 21 will be permitted before the first ratchet tooth seats against the pawl 36. This slight retrogressive movement of belt 21 draws the successive work pieces out of contact with work piece 23 on the conveyor table 40 before the propelling lug 42 engages the last mentioned work piece to propel it longitudinally.

The wrapping web is supplied from a parent roll 44 and passes over an idler 45 to a plate 46 where it is scanned, for the purpose of registering its label with the work, by an electric eye 47 which picks up light reflected by the web from a light source 48. Thence the web passes over idlers 49 and 50 to the feed roll 51 and, after passing about the feed roll, the web is delivered from idler 52. As the web passes over the feed roll, one or more of its margins may be provided with glue by the gluing roll 53 which operates in the glue trough 54, reference being made to Fig. 2.

It is the ordinary practice in wrapping articles by entubing them in a moving web to first channel the web and then to drop into it from above the article to be entubed therein. For the purposes of the present invention, I have found it more satisfactory to form the moving web into an inverted channel into which the work is delivered from below so that the lapping margins of the web in which the article is entubed are disposed below rather than above the article.

This effects this desirable relationship without requiring that the article be fed into the machine upside down and later inverted. Inversion is impractical for many objects. For example, many candy bars have rounded tops which make it difficult, if not impossible, to wrap them upside down.

As the web 55 leaves roll 52 en route to the former 43, its edges first turn upwardly as shown in Fig. 17. The former comprises a downwardly opening channel, the top of which is formed of block 56 supported by bracket arms 57. The sides of the channel comprise the folding wings 58, 59 which extend downwardly from the sides of block 56 and have inwardly directed flanges 60, 61 which lap beneath the initially open channel.

As the web is formed into channel shape by encountering the wings 58, 59 (Fig. 1), its margins are brought inwardly and turn up more sharply. However, as the movement of the web continues to the point where the flanges 60 and 61 are engaged, the sides of the web are turned inwardly and lapped by such flanges as shown in Fig. 19. Plate 62 within the former imposes light pressure to hold the web to the top of the entubed article.

As the wrapper advances and is channeled to provide a downwardly opening trough, the synchronized movement of the conveyor chain 41

pushes into the downwardly channeled wrapper the work piece last deposited on the slotted conveyor plate 40 and immediately such work piece is enveloped or entubed by the completion of the folding of the wrapper by the wings 58 and 59 and their respective flanges 60 and 61. Thus, as the wrapper and entubed work pieces, relatively spaced therein, leave the entubing mechanism at 43, the wrapper and its spaced work pieces are engaged between the forwardly moving flights of laterally spaced propelling belts 64, 65, the inner flight of each belt being provided with a pressure plate at 66 for holding the belt to the work and assuring the forward propulsion of the work between the belts, the work being supported from beneath by plate means 67. With the wrapper thus snugly entubed about the spaced work pieces, propulsion continues for a sufficient time to allow the setting of the adhesive on the lapping margins of the entubing wrapper web 55, whereby to seal such margins to each other about the entubed work pieces.

Each belt and its pulley, and supporting plate 67 comprises a unit laterally adjustable to accommodate work pieces of differing width.

Shafts 69 and 70 are spaced above and below the path of the work pieces to clear the work pieces as they leave conveyors 64 and 65. Shafts 69 and 70 carry mating crimping dies 71, 72, and cut-off dies 73, 74. Shaft 69 further carries cams 75, 76 engaged by suitable cam followers on the arms 77, 78 carried by rock shafts 80, 81 respectively. At a lower level, the respective rock shafts have like arms indicated in dotted lines at 82 in Fig. 1, which carry the respective tuck-ing rolls 83. After each entubed work piece passes between the shafts 69 and 70, the cams 75, 76 permit the oscillation of rock shafts 80, 81 by the respective springs 83 to urge the crimping rolls inwardly, whereby to form a pleat in the sides of the entubing wrapper between the successive work pieces. Immediately the crimping dies 71, 72 flatten and crimp the pleated wrapper as indicated at 84 in Fig. 12 at a point spaced from the entubed work piece, the pleat being visible at 85 between the crimped areas 84 and the entubed work piece. Midway between entubed work pieces, the crimped areas 84 are severed.

As each entubed work piece with the ends of the wrapper crimped at 84, as shown in Fig. 12, leaves the crimping and severing dies, it is advanced at increased speed by lateral conveyors 86, 87 similar to those shown at 64, 65. In the course of its advance, the entubed and separated work piece passes over an elevator 90, as shown in Figs. 1 and 2 and illustrated in more detail in the enlarged views such as Figs. 7, 8 and 12 to 16. The elevator is sufficiently narrow to provide clearance for the gluing fingers hereinafter mentioned. The elevator is carried on a vertically reciprocable plunger 92 urged downwardly by spring 93 whereby the cam follower roller 94 at its lower end is held into contact with cam 95. As the entubed work piece arrives over the elevator, the elevator moves upwardly from the position shown in Fig. 12 toward that shown in Fig. 13, ultimately to force the work between the end folding and clamping plates 96, 97. Meantime, the gluing cam 108 (Fig. 8) is operating follower 109 to raise plunger 110 which has a cross head 111 to which are fastened the gluing fingers 112 for vertical movement upwardly from and return downwardly into the glue through

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113. The fingers 112 are raised from the glue trough sufficiently to pass by the ends of the elevator and to apply spots of glue to the under surface of the wrapper, after which the gluing fingers are lowered back into the trough 113 (Fig. 10).

As the elevator starts upwardly, the vertical tuckers 98, 99, are elevated at an even more rapid rate by their vertically movable slides 100, 101, these slides being cross connected at their lower ends by a yoke 102 carrying a cam follower roller 103 resting on cam 104. At least the vertical tucker blade 98 is preferably pivoted at 105 and provided with a bell crank lever 106 bearing on the cam surface 107 whereby, as the tucker moves upwardly, it will oscillate toward a vertical position from its slightly retrogressive inclination shown in Fig. 7. The purpose of this is to ensure that the tucker blade 98 will follow behind the entubed work piece and push the work piece against tucker blade 99 in the event that the work piece has not fully been delivered at the time the upward movement of the elevator commences.

As clearly shown in the successive views, Figs. 12 to 14, the tucking blades 98 and 99 press tightly against the ends of the entubed work piece while the projecting crimped wrapper ends 84 are caught by folding plates 96, 97, and folded downwardly snugly over the end of the work piece and the intervening tucking blades 98, 99.

As the work piece continues upwardly between plates 96, 97, the tucking blades 98, 99 are retracted and when the entubed work piece reaches the level shown in Fig. 15, the elevator 90 also moves downwardly.

Before the elevator 90 begins to be lowered, the horizontal tucking arms 115 move in laterally through the openings 116 in the respective plates 96, 97. As best shown in Figs. 1 and 12, the horizontal tuckers 115 comprise arms which project forwardly from the respective racks 117, 118 which are illustrated in Figs. 7 and 8. These racks mesh with respective pinions 119, 120, both of which mesh, in turn, with a rack 121 which is vertically reciprocable and carries at its lower end a roller 122 bearing upon cam 123. Thus the raising of roller 122 and rack 121 by cam 123 causes racks 117, 118 to move toward each other whereby the fingers 115 move inwardly from the position shown in Fig. 15 to that shown in Fig. 16, thereby pressing beneath the work piece the crimped ends 84 of the wrapper which, engaging the spots of glue, previously deposited on the under surface of the wrapper, are adherent thereto.

The initial entry of the horizontal tucker blades 115 beneath the work piece supports the work piece while the elevator 90 drops therefrom, the dropping movement having commenced in Fig. 15.

The wrapping is now complete except for the setting of the glue which holds the ends of the wrapper to the face of the wrapped work piece. The wrapped work piece is now ejected by the ejector arms 125, these preferably being in the form of plates disposed vertically just within the clamp plates 96, 97, and carried by racks 126 meshing with pinions 127. These pinions and another pinion 128 are on the same shaft 129, whereby such shaft may be rotated by the vertical reciprocation of rack 130 by the rotation of a cam 131 engaging the cam follower roller 132 on the lower end of rack 130. The upward movement of rack 130 is communicated

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through pinion 128 and shaft 129 and pinions 127 to effect forward reciprocation of racks 126 and ejector arms 125. This moves the wrapped bar from between the end folding plates 96, 97, which engage its ends, and the horizontal tuckers 115 beneath its bottom, and the pressure plate 134 which engages its top. The wrapped bar is delivered on to the table 135 and beneath a pressure plate 136 which extends longitudinally of such table. Here the wrapped bar is engaged by one of the propelling fingers 137 of conveyor chains 138 which operate beneath the table, the fingers 137 projecting upwardly through slots 139 in the table to engage and propel the work.

The pressure on the longitudinally extending plate or strip 136 is provided by compression springs 140 seated against a carrier 141 which is vertically adjustable by screws 142 whereby not only to accommodate work pieces of varying sizes but readily to permit adjustment of pressure. The screws are threaded into the carrier 141 and supported by brackets 143. The whole arrangement is such as to confine the wrapped bar under just sufficient pressure to hold the inwardly turned ends of the wrapper beneath the wrapped bar until the glue has set. Where the conveyor chain 138 passes about its sprocket 144, the propelling lugs 137, which have theretofore been riding on a track 145, are permitted to pivot from their erected positions to the retracted positions shown in Fig. 9, whereby the lug drops and the bars are pushed by successively arriving bars on to the discharge table 147 from which they are removed by the operator. Each of the propelling lugs 137 is pivoted to the chain on a fulcrum which is forwardly of the point at which the lug projects upwardly into a position for work engagement, the pivot accommodating the dropping of the lug after it clears the track 145. Preferably two conveyors are used as shown in Fig. 11, although one may suffice. Each conveyor comprises a pair of chains between which the lugs are pivoted, the track 145 comprising a plate. Guide rails at 149 confine the ends of the wrapped work during propulsion.

While the driving connections may be varied without affecting the principle of operation, those shown will be briefly described.

The motor 150 represents the source of power which drives through worm 151 and worm gear 152, pinion 153 and gear 154, a shaft 155. The motion transmitted at reduced speeds through the several gears above described to shaft 155 is now divided between the several parts of the machine. The sprocket 156 on such shaft drives chain 157 which communicates motion to a shaft 158 on which the helical gears 159 mesh with gears 160 (Fig. 2) to drive the pulleys over which the belts 86 and 87 operate.

Bevel gearing 162 communicates motion from shaft 155 to a longitudinally extending shaft 38 which, through bevel gears 164, drives cross shaft 165. It is shaft 38 upon which is mounted the eccentric 29 for the intermittent operation of the infeed conveyor 21 as above described.

On the cross shaft 165 is a gear 166 which, through an idler pinion 167 and another gear 168 (Fig. 2 and Fig. 3), drives the forward sprocket 169 over which the conveyor chain 41 is operated to deliver the work into the inverted channel of the wrapping web.

The cross shaft 165 extends at the back of the machine frame to drive one of the gears 186 of a differential gear set having pinions 187 mounted

in a casing 168 which is operated by pinion 169 and chain 170 from an auxiliary motor 171. The other gear 172 of the differential gear set is connected to a pinion 173 (Figs. 2 and 3) which, through an idler gear 174, and gear 175, drives shaft 176 upon which feed roll 51 for the wrapping web is mounted. Since the feed of the wrapping web over roll 51 must be synchronized with the rate of advance of the wrapper tube after the articles are entubed therein, power is also taken from shaft 176 through the bevel gear set 177 to drive shaft 178 which, through bevel gear set 179, communicates motion to the cross shaft 180. The spiral gears 181 on shaft 180 drive the complementary gears 182 connected with the pulleys over which belts 54 and 55 operate as best shown in Figs. 1 and 2.

On the main longitudinal drive shaft 30 is a cam 184 which, through cam follower 185, operates a switch 186. The electrical impulses thus generated are synchronized through integrating mechanism not shown, with the impulses generated in the electric eye 47. According to whether these respective impulses from these various sources are in synchronism or out of synchronism, the motor 171 may be operated to correct the rate of wrapper feed in accordance with the rate of article feed on conveyor 41, thus properly registering each label with an article.

If motor 171 is at rest, shaft 165 will rotate gear 166 to transmit motion through the differential pinions 167 to turn gears 172 and 173 in the opposite direction at the same rate at which shaft 165 is rotating. If the electrical impulses received by the electric eye at 47 register with those received through the closing of the switch 186, the motor 171 will operate and, according to its direction of operation, it will either add to or subtract from the rate of rotation of gear 173 by rotating the differential cage and revolving the pinions 167 about the axis of shaft 165. Thus, according to the design of the machine, compensation is effected.

The mechanism for effecting such label registration through the use of integrating electrical mechanism for the operation of the differential above described is known, and, since it forms no part of the present invention, will not be described here in more detail.

Power is also taken from the motion distributing cross shaft 155 through the gear 198 and the meshing gear 189 to drive the cam shaft 190 on which are mounted the gluer cam 103, the elevator cam 93, the vertical tucker cam 104, the horizontal tucker cam 123, and the ejector cam 131, in that order as viewed in Fig. 8.

Shaft 190 also carries a worm at 191 which drives worm gear 192 on shaft 193. Through the sprocket 195 on this shaft, motion is transmitted by a chain 196 to the sprocket shaft 197 on which sprockets 198 operate the conveyors 138 for propelling the wrapped articles to the discharge point.

Motion from the same power dividing shaft 155 is transmitted to shaft 69 for the operation of the crimping and cut-off dies and the tucking rolls through a specially designed pair of eccentric gears 199, 200 separately illustrated in Fig. 6. Shafts 69 and 70 are geared together at 201 to partake of the irregular rotating movement which results from the intermeshing of the eccentric gears 199, 200. The eccentricity of the gears 199, 200 causes a relatively accelerated motion of the crimping and cutting dies whereby the peripheral speed of the dies corresponds to the

lineal speed of the wrapper; at the moment these dies are interengaged through the wrapping web, the relatively faster motion on this portion in the cycle is compensated by a relatively slower motion through the rest of the cycle when the dies are inoperative. The dies used are preferably small, as large dies would require a greater length of web to intervene between the wrapped articles in order that the dies might mate without damaging the articles. Since the dies are small, their peripheral travel is less than the length of the article and in order that the dies may register with the web intervening between successive articles, it is necessary to retard their rotation during the passage of the articles and then to accelerate them during the crimping and cutting movement.

I claim:

1. In a wrapping machine having a moving web of wrapping material into which elongated work pieces to be wrapped are transversely fed, the combination of longitudinal feeding means for elongated work pieces, said means comprising conveyor mechanism having a work propelling lug, said conveyor mechanism having a path of movement on which the work pieces intersect the moving web, together with means for delivering such work pieces laterally to said conveyor mechanism and comprising a conveyor belt in friction drive with a succession of work pieces, and actuating mechanism for the intermittent operation thereof in a direction of advance and for a distance sufficient for delivery of a single workpiece to said conveyor mechanism, said belt actuating mechanism including means for the retraction of said belt following each advance and for a distance substantially less than the advance, whereby to retract a following workpiece from contact with that delivered and from the path of said lug.

2. In a wrapping machine, the combination with a conveyor for delivering work pieces to be wrapped, of an infeed conveyor upon which work pieces are delivered to the conveyor first mentioned, said infeed conveyor having intermittent driving connections including a rotor, an oscillatory driving member in friction clutch relation to the rotor, means for oscillating said member through a range adequate for the delivery of a single work piece from the end of said second conveyor, and means for arresting retrogressive movement of said infeed conveyor after the frictional return of such conveyor has been initiated by the returning oscillation of such member, whereby to withdraw a successive work piece on the infeed conveyor from contact with the delivered work piece.

3. In a device of the character described, a drive comprising driving and driven parts in substantially uniform and continuous frictional engagement, continuously operating means for operating the driving part forth and back through a predetermined range, and means for arresting the back movement of the driven part whereby to effect slippage between the driving and driven part during the back movement of the driving part, the driven part being thereby intermittently driven in a forward direction.

4. The combination set forth in claim 3 in which the means for arresting the backward movement of the driven part is disposed rearwardly of the point of farthest advance of the driven part and thereby allows a predetermined lost motion whereby some back movement of the

driven part is effected following each forward intermittent advance thereof.

5. The combination set forth in claim 3 in which the driving part comprises a friction plate and the driven part a rotor with which said plate is mounted for substantially coaxial oscillation.

6. The combination set forth in claim 3 in which the driven part is provided with ratchet teeth, together with a pawl engageable with successive ratchet teeth against the backward movement of the driven part.

7. In a wrapping machine, the combination with a longitudinal conveyor of means for feeding a succession of workpieces into spaced positions on said longitudinal conveyor, said means comprising a conveyor belt laterally disposed respecting the longitudinal conveyor and having its terminal end in work-delivering relation to the side of the longitudinal conveyor, said belt being adapted to support a succession of workpieces, means for advancing said belt in a work-delivering direction for a distance sufficient to deliver onto said longitudinal conveyor the workpiece most advanced on the belt, said advancing means including means for retracting said belt following each advance thereof for a distance less than the advance but sufficient to withdraw from contact with the delivered workpiece that workpiece on said belt which is next to the workpiece delivered.

8. The combination with a first conveyor, of a second and infeed conveyor arranged to deliver successive work pieces from its end onto the first conveyor, and means for intermittently advancing and partially retracting the infeed conveyor whereby to remove successive work pieces from contact with the work pieces delivered the intermittent advancing and partial retracting means comprising a shaft, a friction drive plate mounted for oscillation substantially coaxial with the shaft, means for oscillating said plate through a range sufficient, when communicated to the shaft, to advance the infeed conveyor for the delivery of a work piece, means frictionally transmitting motion from the oscillatory plate to the shaft, a ratchet disk on the shaft provided with teeth, and a stationary pawl in operative association with said teeth for engaging successive teeth to resist retrogressive rotation of said shaft, the spacing between such teeth

being slightly less than the advance rotation of said shaft whereby motion frictionally transmitted to said shaft from said plate during the reverse oscillation of said plate initiates the retractive movement of said infeed conveyor before such movement is arrested by engagement of one of said teeth with said pawl.

9. An intermittent drive comprising the combination with a driven part and a driving part having means for its continuous forth and back operation, of a friction member and a positive member acting on the driven part, the friction member being in constant operation thereon and the positive member being a pawl having unidirectional effect thereon, the driven part having teeth with which the pawl is engageable, and one of said members being connected with the driving part and the other having a relatively fixed support.

10. The combination with a first conveyor, of a second and infeed conveyor having its delivery end in operative work discharging proximity to the first conveyor for the delivery of successive work pieces from its end onto the first conveyor, such delivery being facilitated by the normal disposition of the work pieces in abutting relationship on the infeed conveyor, and driving connections for said infeed conveyor including a first friction plate connected with the conveyor, a driving friction plate in bearing contact with the first friction plate, means for the continuous actuation of the driving friction plate in a forth and back direction, and an overrunning stop accommodating free forward advancing movement of the infeed conveyor and resisting backward movement of the infeed conveyor, said stop being positioned to be effective on said infeed conveyor to resist backward movement thereof after a limited backward movement has occurred, whereby successive work pieces on the infeed conveyor will be withdrawn from contact with work pieces delivered therefrom onto the first conveyor.

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