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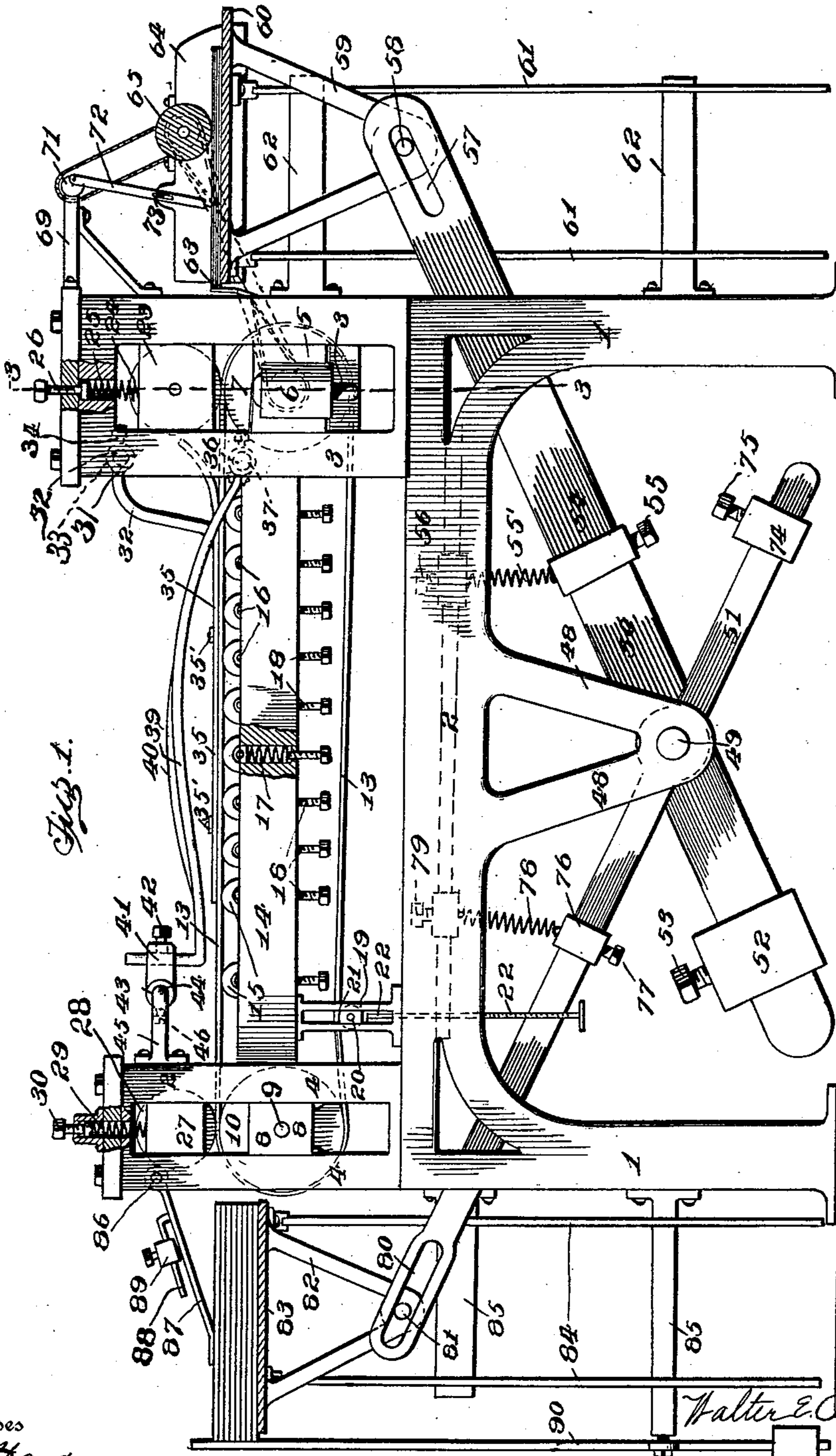
Patented Nov. 18, 1902.

W. E. REULING.
CARTON MACHINE.

(Application filed Dec. 2, 1901.)

(No Model.)

3 Sheets—Sheet 1.



Witnesses
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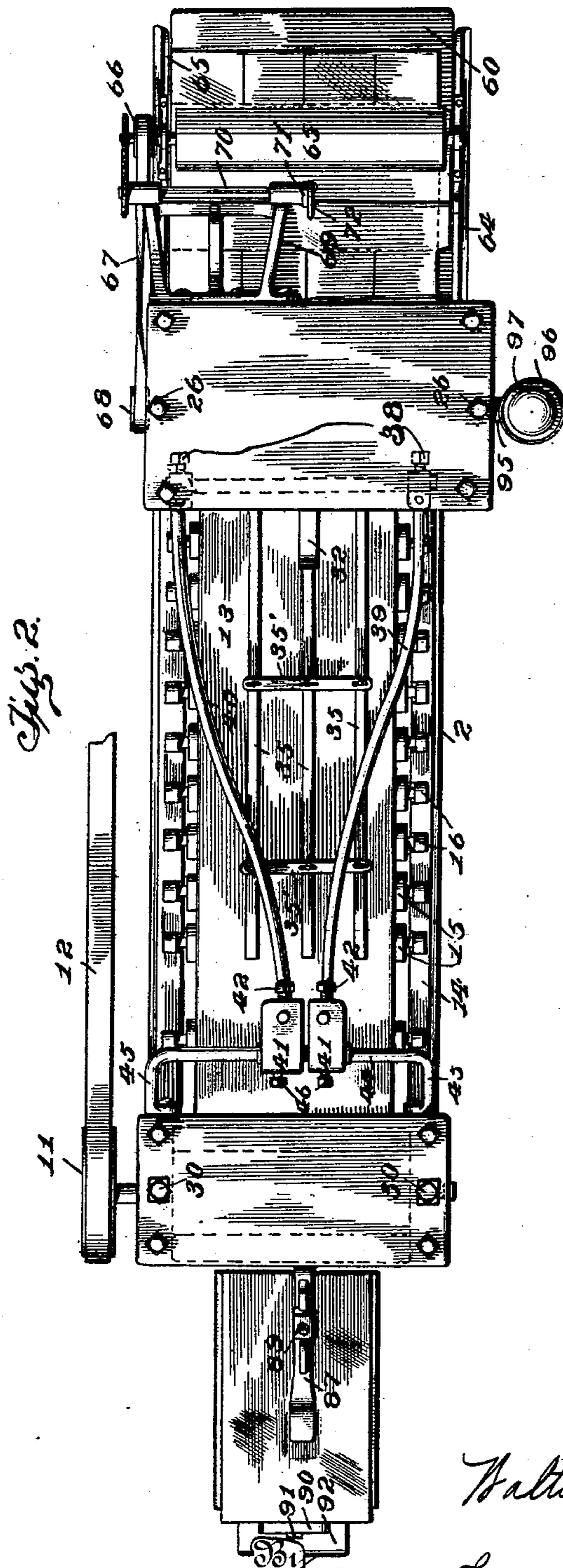
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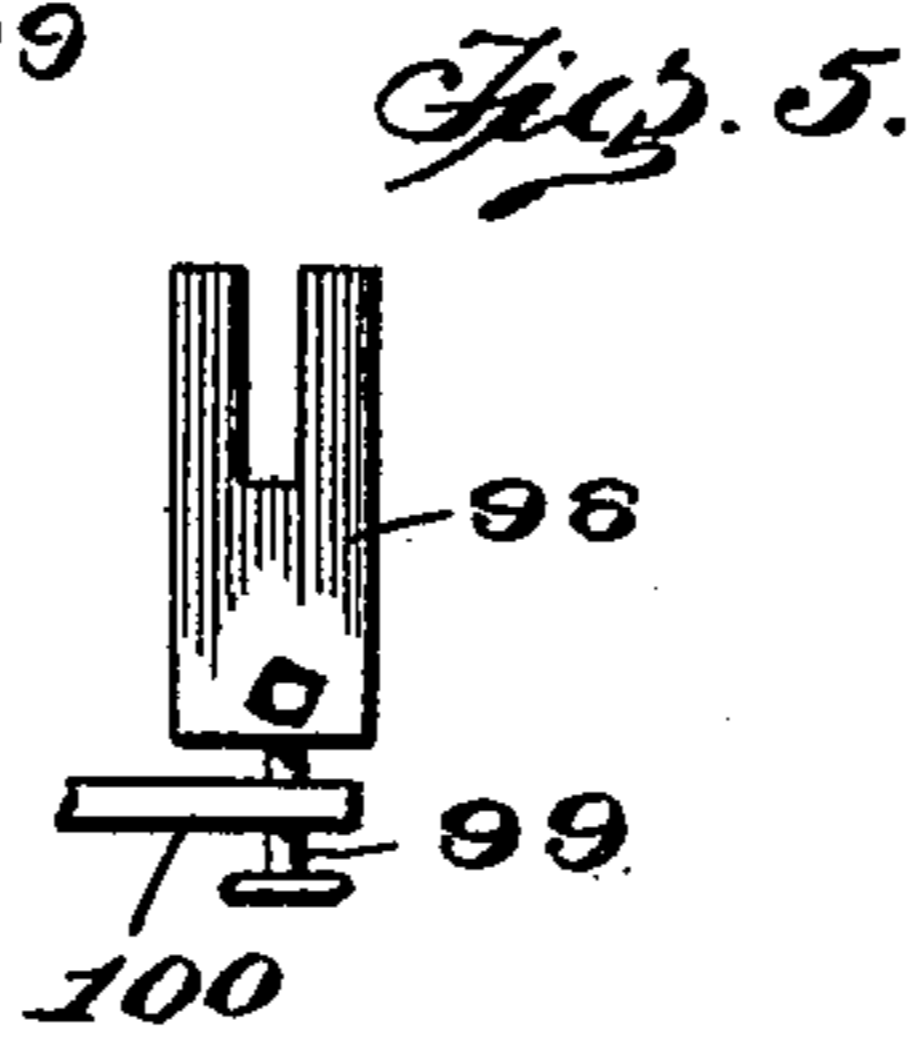
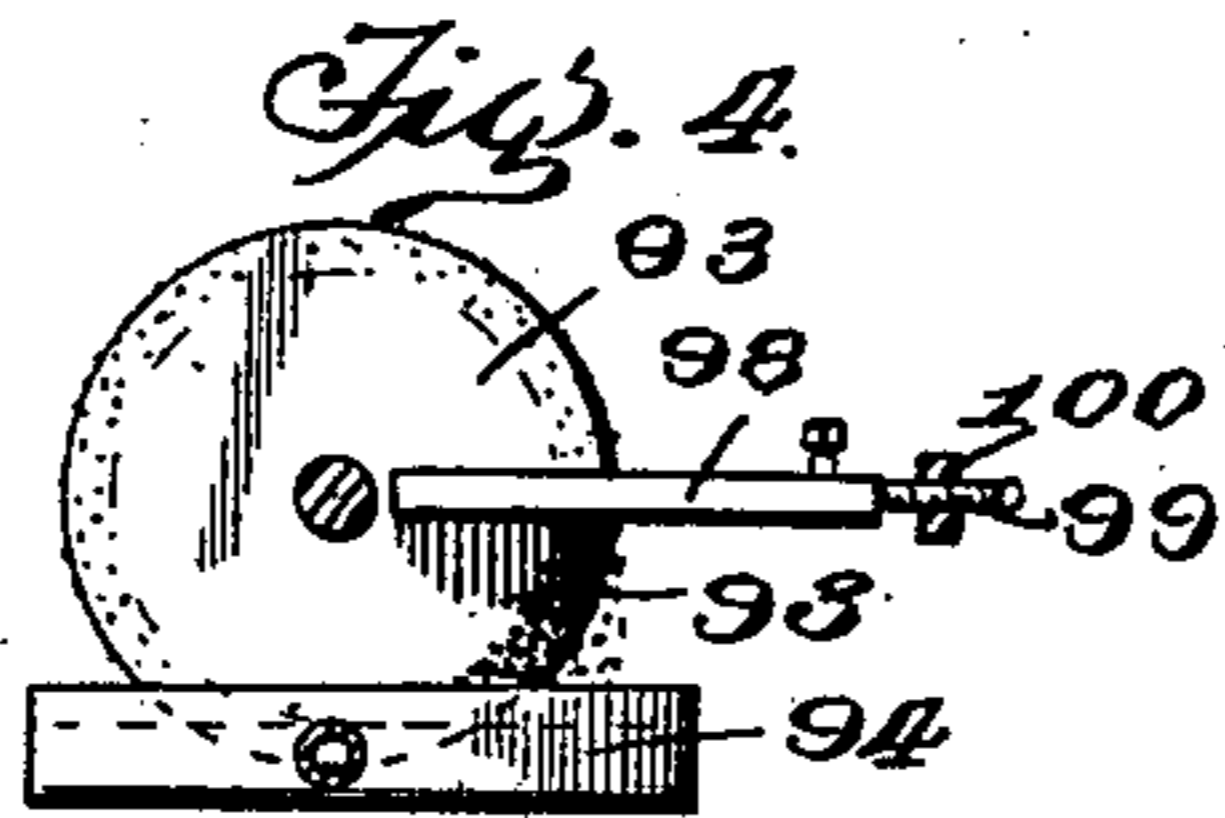
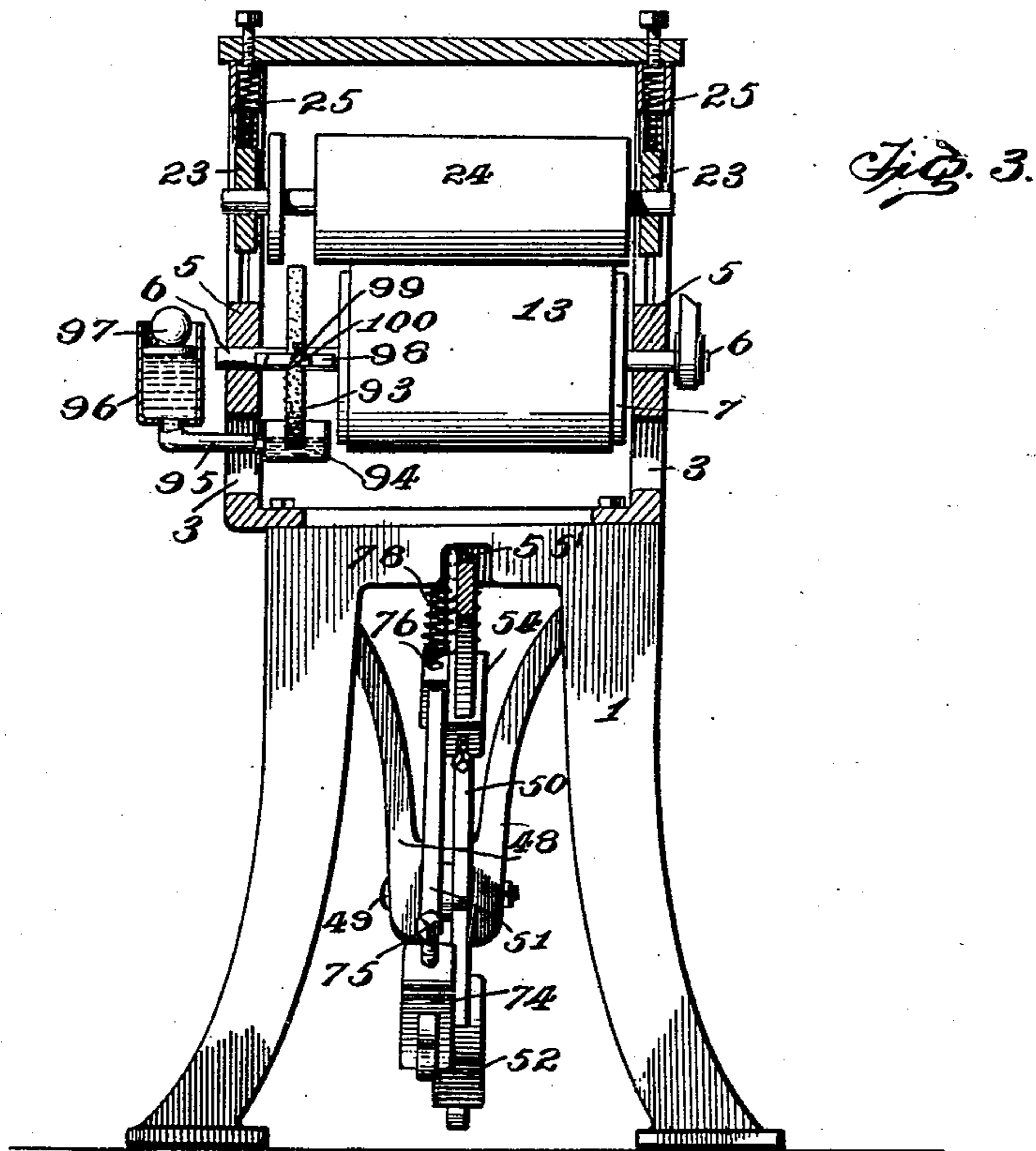
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UNITED STATES PATENT OFFICE.

WALTER E. REULING, OF MUSCATINE, IOWA.

CARTON-MACHINE.

SPECIFICATION forming part of Letters Patent No. 714,032, dated November 18, 1902.

Application filed December 2, 1901. Serial No. 84,397. (No model.)

To all whom it may concern:

Be it known that I, WALTER E. REULING, a citizen of the United States, residing at Muscatine, in the county of Muscatine and State of Iowa, have invented certain new and useful Improvements in Carton-Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The present invention relates to improvements in carton-making machines, and more particularly to a machine for pasting carton-blanks.

One of the objects in view is the production of a machine designed to receive a carton-blank properly cut and scored, fold the same, and paste the longitudinal flap of one of the sides to its contiguous side, and a second object is the production of such a machine designed to be adjusted to receive various sizes of carton-blanks.

With these and other objects in view the invention consists, in combination with a suitable frame, of means for folding a blank carton in such manner that the longitudinal flap of one side is brought into contact with the contiguous side, means for automatically feeding carton-blanks to said folding means, and means for carrying the blanks past the same.

It also consists of certain other novel constructions, combinations, and arrangements of parts, as will be hereinafter fully described and claimed.

In the accompanying drawings, Figure 1 represents a view in side elevation of a carton-making machine embodying the features of the present invention. Fig. 2 represents a top plan view of the same. Fig. 3 represents a transverse vertical section of the same, taken on line 3 3 of Fig. 1. Fig. 4 represents an enlarged detail view of the pasting mechanism, and Fig. 5 represents a similar view of the paste-scraper.

In carrying my invention into practice I employ, as seen in the drawings, a suitable framework comprising supporting-legs, as 11, carrying a bed or table, as 2, at either end of which are arranged pairs of upright standards, as 3 3 and 4 4. Between each pair of standards 3 is mounted a journal-box, as 5, having

journalled therein a suitable transverse shaft, as 6, carrying a drum, as 7. Between each pair of standards 4 is also arranged a journal-box, as 8, carrying a transversely-arranged shaft, as 9, which shaft in turn carries a drum, as 10, and one of its projecting ends also carries a fixed power-pulley, as 11, receiving power from any suitable source by any preferred means, as a belt 12. An endless belt, as 13, is carried by drums 7 and 10, and a longitudinally-arranged brace, as 14, connects the inner upright standards of the pairs 3 and 4 between the upper and lower portions of belt 13. Rotatably mounted upon the upper face of brace 14 are a plurality of rollers, as 15, supported in suitable journal-boxes, as 16, each of which boxes is supported by a spring, as 17, carried by brace 14 and pressed by a set-screw, as 18, whereby the tension of the springs may be controlled. Moving in suitable guides, as 19, connecting the bed 2 and brace 14 at either edge thereof, outside the edges of belt 13, is arranged a journal-box, as 20, supporting a roller, as 21, which is designed to be held in contact with the lower face of belt 13. Each of boxes 20 is supported upon a suitable screw, as 22, threaded through bed 2 and designed to be screwed up or down to tighten or loosen belt 13, as desired.

Slidably mounted between the standards 3 above boxes 5 are arranged suitable journal-boxes, as 23, carrying a roller, as 24, each of the said boxes being downwardly pressed by a spring, as 25, whose tension is governed by an attached screw, as 26, threaded through the upper brace, connecting the upper ends of the standards 3. Similarly arranged with respect to standards 4 are boxes 27, carrying a roller, as 28, and provided with tension-controlling springs, as 29, and screws, as 30, operating in the same manner as the parts just described with reference to the standards 3. It will thus be seen that the rollers 24 and 28 will each rest normally upon that portion of belt 13 above the drums 7 and 10, respectively, but are capable of moving upwardly for permitting the passage of an article between the belt and the rollers.

A transversely-arranged rod, as 31, is preferably rigidly fixed between the inner standards 3 and supports an arm, as 32, having an

eye, as 33, surrounding and pivotally engaging said rod 31, which eye carries set-screws, as 34 34, whereby the eye may be fixed against pivoting upon said rod at any desired point.

5 The arm 32 preferably projects inwardly approximately on a horizontal plane and then turns downwardly to an approximate vertical plane and carries at its lower end a tongue, as 35, which is formed, preferably, of parallel
10 slats or bars and provided with means, as slot-and-pin engagement, with transverse connecting-bars, as 35' 35', for permitting lateral adjustment thereof for increasing or decreasing the width of said tongue. The slats forming tongue 35 lie contiguous to or in contact
15 with belt 13 for the greater portion of their length, the front ends thereof being curved upwardly for purposes to be described.

From each of the inner standards 3 later-
20 ally projects one end of a transversely-arranged rod, as 36, carrying a rotatably-mounted eye, as 37, provided with a set-screw, as 38, for locking the same upon its respective end of rod 36 against movement. Piv-
25 otally secured to eyes 37 are rods, as 39 and 40, respectively, which rods curve upwardly and inwardly and have their free ends passed through links, as 41, after having been bent from a horizontal to a vertical plane, suitable
30 set-screws, as 42 42, being threaded through the material of said link 41 and engaging said upwardly-bent ends for locking the same at any desired height for purposes hereinafter set forth. It will be seen by reference to Fig.
35 1 that the rod 40 rises slightly higher than rod 39, as will be set out hereinafter. The links 41 are provided with eyes, as 43, surrounding shaft 44, transversely arranged and secured to brackets or arms 45, carried by the
40 upper transverse brace of the inner standards 4. Each of eyes 43 is provided with a set-screw 46, passed therethrough and contacting with shaft 44, whereby each link 41 may be locked in any given pivotal position.

45 Depending from the under face of the bed 2 is a suitable bracket, as 48, preferably bifurcated at its lower end and carrying a transversely-arranged shaft, as 49, which is designed to pivotally support levers, as 50 and
50 51, between the arms of the bifurcation of said bracket 48. The lower end of lever 50 preferably carries a weight, as 52, which surrounds the lever and is slidable longitudinally thereof and is provided with a set-screw,
55 as 53, for engaging said lever for retaining the weight at a given point on the lever. Above the pivot-point the lever 50 carries a slidably-mounted collar, as 54, provided with a locking set-screw, as 55, and having secured
60 thereto the lower end of a suitable spring, as 55', which spring preferably has its upper end contacting the under face of bed 2, and the tension of said spring is controlled by a screw,
as 56, threaded through bed 2 and engaging
65 the upper end of the spring.

The outer free end of lever 50 is preferably slotted, as at 57, which slot is engaged by a

pin, as 58, carried by a bracket, as 59, which bracket supports a table, as 60. It will be
70 seen by the structure just described that the table 60 is designed to move vertically, the slot 57 permitting lever 50 to have its pivotal movement, while bracket 59 moves in a perfectly vertical plane, and in order to guide
75 the table 60 in its movement suitable vertically-arranged rods, as 61 61, project downwardly from and are secured to the under face of said table and pass through guiding-grooves formed in laterally-projecting brackets, as 62 62.
80

A transversely-arranged stop, as 63, extends for the width of table 60 contiguous to the inner end thereof and supported by the outer standards 3. Also supported by the
85 said outer standards by means of suitable brackets are longitudinally-arranged side pieces, as 64, each of which is arranged approximate its respective side of table 60 but not contacting therewith, whereby said table
90 may move up and down between the two side pieces.

Transversely mounted in suitable bearings in the side pieces 64 is a suitable, preferably serrated, feeding-roll, as 65, whose axle carries a power-pulley, as 66, receiving motion
95 from a crossed belt, as 67, which belt is carried by a pulley, as 68, mounted upon one end of shaft 6, from which it receives motion.

A bracket, as 69, is supported by the outer standards 3 above table 60 and supports a
100 transversely-arranged shaft, as 70, which shaft is connected preferably by a chain and sprockets or other suitable power-conveying means with the axle of roller. The inner end of shaft 70, as seen in Fig. 2, extends preferably to a point approximately midway of the width of table 60 and carries an eccentric or suitable crank, as 71, carrying a suitable
105 pitman, as 72, pivoted thereto and having its lower end free and provided with a penetrating-point for purposes hereinafter mentioned. The pitman 72 may be provided with any suitable guiding-bracket, as 73, for limiting the lateral movement of the pitman.

Lever 51 is provided near its lower end with
115 a longitudinally-slidable weight, as 74, provided with a set-screw, as 75, for locking the weight at any desired point. Above the pivot-point of lever 51 is arranged a slidably-mounted sleeve, as 76, provided with a locking set-screw, as 77, and designed to carry the lower end of a suitable spring, as 78. A suitable
120 set-screw, as 79, is threaded through a portion of bed 2 and is designed to contact with the upper end of spring 78 and to control the tension thereof, whereby the movement of lever 51 will be cushioned. The outer free end of lever 51 is arranged similarly to lever
125 50 with an elongated slot, as 80, engaged by a pin, as 81, carried by a bracket 82, supporting a table, as 83. Vertically-arranged rods, as 84 84, are secured to and extend downwardly from the under face of table 83 and pass through slidable guiding-grooves in brackets,
130

as 85 85, extending outwardly from the frame of the machine. It will thus be seen that table 83 is designed to move downwardly in a vertical plane for purposes hereinafter stated.

5 Pivotaly supported by a transversely-arranged rod, as 86, is an arm 87, designed to have its lower free end normally resting upon the upper face of table 83, but automatically raising to permit the passage therebetween
10 of an article brought into contact with said arm from the rear or under face thereof. An auxiliary preferably parallel arm, as 88, is carried by the upper face of arm 87, which
15 auxiliary arm is preferably provided with an adjustable weight, as 89, the movement of which along the auxiliary arm is designed to increase or decrease the pressure of the free end of arm 87 upon the table 83 or the article supported thereby.

20 A swinging arm, as 90, is pivoted at 91 to the outer end of the lower bracket 85 and is provided near its lower end with a suitable weight, as 92, the upper end of said arm projecting above and contiguous to table 83 and
25 designed to swing laterally away from the same, but to normally remain in a vertical position for purposes hereinafter described.

In operation any desired number of carton-blanks properly cut and scored are placed
30 upon table 60, the weight 52 normally holding the upper blank in contact with the periphery of feeding-roller 65, with the inner edge of the blank contacting with stop 63, presuming the belt 13 to be in motion, the rotation of roller
35 65 not exerting sufficient pressure upon the carton-blank to cause the same to jump the said stop. The pointed end of pitman 72, however, is now brought into contact with the upper blank and lifts the inner edge above the
40 stop 63, the guiding-bracket causing the forward as well as upward swing of the pitman for imparting a forward movement to the blank, and the roller 65 is then able to feed the blank forward over said stop and between
45 roller 23 and drum 7 or, more properly, belt 13. The removal of the top blank from table 60 sufficiently lightens the same to permit the weight 52, acting through lever 50, to raise the said table until the second blank contacts with rolls
50 65, and the second and succeeding operations are precisely similar to the first, the stop 63, together with the feeding mechanism described, serving to prevent more than one blank being fed at a time. Near one end of
55 drum 7, spaced therefrom and carried by shaft 6, is a paste-wheel, as 93, which has its periphery rotated within a paste-receptacle, as 94, arranged beneath the wheel, and when a heavy paste is employed a supply-tube, as
60 95, extends laterally from receptacle 94, preferably turns upwardly, and carries at its upper end a paste-supply tank, as 96. A suitable weight, as 97, preferably rests upon the paste within tank 96 for forcing the feed of
65 the same into receptacle 94. A bifurcated scraper, as 98, is supported in any preferred manner, with the arms of the bifurcation

passed on either side of wheel 93. A set-screw, as 99, threaded through a supporting-bracket, as 100, is also threaded into scraper 98, where- 70
by said scraper may be adjusted with respect to its relation to wheel 93 for governing the amount of paste carried by the periphery thereof. In further operation the carton-blank is caught by belt 13, passed be- 75
neath the front end of tongue 35, the upward curve of which facilitates such passage, which tongue is adjusted to approximately the width of two of the sides of the carton, whereby the two outer sides of the blank are caught by 80
the rods 39 and 40, respectively, the side of the carton-blank on the side of the machine corresponding with rod 39 carrying the longitudinal edge-connecting flap, and the said flap having been brought, as the blank passed 85
between roller 23 and belt 13, into contact with the periphery of paste-wheel 93, whereby it was given a coat of paste. As before stated, the rod 39 is lower than rod 40, where-
by as the carton-blank is moved along tongue 90 35 the outer sides thereof are caused to lap, with the pasted flap beneath and its paste side up, whereby the opposite side of the blank is designed to extend above and be brought down upon the paste side of said 95
flap and the parts secured together as the blank is passed out between roller 28 and that portion of belt 13 passing over drum 10. It will be seen that in operating upon vary-
ing sizes of carton-blanks the rods 39 and 40 100 will have to be adjusted to varying relations to the tongue 35 and to each other, which adjustments are accomplished by the pivotal connections of said rods, together with the link supporting the upper ends of the 105
rods, and the rods are held in their adjusted positions by means of the set-screws, as will be seen from the foregoing description, taken in connection with the disclosure in the drawings. The carton-blanks are fed 110
beneath roller 23 in rapid succession and of course are fed upon table 83 at a corresponding rate. As each carton is forced out upon table 83 it strikes against the under or rear face of arm 87, lifting the same and 115
passing on until its edge strikes against arm 90, whereby it is stopped and held upon table 83 under the weight of arm 87, whereby should part of the paste be yet undry the same will be given an opportunity to dry 120
while the contiguous sides of the carton are held against each other by the said arm 87. As each succeeding carton is forced upon table 83 the table, by the weight of the carton, automatically moves downwardly, the weight 125
74 of lever 51 being so positioned as to exactly counterbalance any number of cartons upon table 83, with the upper face of the flat carton in the horizontal plane of belt 13, the weight of arm 87 of course being compen- 130
sated for by the position of weight 74.

When any desired number of cartons have been placed upon table 83 and it is desired to remove the same, the arm 90 is swung later-

ally against the weight 92 and upon its pivot 91 beyond the edge of table 83, whereby the cartons may be removed without contacting with said arm.

5 It will be apparent that carton-blanks may be fed at a very rapid rate to my improved mechanism, pasted, and removed with facility, and after such removal the cartons are ready to be filled and have their end flaps
10 turned in for placing the contained goods upon the market, or the flat condition of the cartons after undergoing the operation above described facilitates packing and shipment of the cartons themselves should such be desired.
15

It will of course be understood that although I have thus specifically set forth the details of my improved mechanism yet I do not wish to be understood as limiting myself
20 to the precise details of structure set forth, but shall feel at liberty to deviate therefrom to any degree within the spirit and scope of the present invention.

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

1. In a mechanism of the class described, the combination with a suitable frame, of rods in either side thereof converging toward the
30 center, one being arranged slightly above the other, a link engaged by the rear end of each of said rods, means for locking said ends at various vertical adjustments in such links, means for delivering a carton-blank to said
35 rods in such manner that the free sides thereof will strike the respective rods and be moved longitudinally of the same for folding the sides together, substantially as described.

2. In a mechanism of the class described, the combination with a suitable frame, of rods extending longitudinally thereof at either
40 side and converging toward the center, means for adjusting the carton-blank contacting the ends of said rods and retaining the same at various heights with respect to the frame
45 while the opposite ends thereof remain in the same plane, and means for passing carton-blanks longitudinally of said rods with their free sides contacting therewith, substantially
50 as described.

3. In a mechanism of the class described, the combination with a suitable frame, of drums mounted near each end thereof, an endless belt carried thereby, cushioned rollers
55 supporting the upper portion of said belt, a roller slidably mounted in said frame above each of said drums, means for feeding carton-blanks to said belt between one of said drums and its roller, means for applying paste to the
60 attaching, longitudinal flap of said blank, means for folding said blank in such manner as to bring the edge of one of the free sides into contact with the pasted flap, and means for receiving the blanks after they have been
65 pasted and passed out between the other drum and its roller, substantially as described.

4. In a mechanism of the class described the combination with a suitable frame, of rods pivoted on either side thereof and converging toward the center, means for adjusting the
70 free ends of said rods vertically, independently of each other, links engaging and supporting the free ends of said rods, means carried by the links for locking the said ends in their various positions, means for delivering
75 carton-blanks beneath said rods in such manner that the sides thereof will strike the respective rods for effecting their folding, substantially as described.

5. In a mechanism of the class described the combination with a suitable frame, of rods extending longitudinally thereof at either side
80 and converging toward the center, means pivotally supporting said rods for permitting the same to swing in a vertical plane, pivotal links engaging the free ends of said rods, means
85 carried by the links for locking said rods in various horizontal planes, and means for passing carton-blanks longitudinally of said rods with their free sides contacting therewith,
90 substantially as described.

6. In a mechanism of the class described, the combination with a frame, of a vertically-movable table at one end thereof, means for
95 guiding said table in its movement, a lever pivoted in said frame and carrying said table at one end, and means at the opposite end of said lever for counterbalancing the weight of said table and its contents, whereby the table is designed to move upwardly upon the
100 removal of any of its contents, a stop, extending transversely of said table for the width of the same at its inner end, supported contiguous to the table but not in contact therewith, and means for feeding carton-blanks placed
105 upon said table over the said stop, substantially as described.

7. In a mechanism of the class described, the combination with a frame, of a vertically-movable table at one end thereof, side pieces
110 supported contiguous said table, a feed-roller mounted upon said sides, means for rotating said roller, means for maintaining the uppermost article supported by said table in contact with said roller, a stop for preventing the
115 forward feed of the articles supported by the table, a pitman supported above said table and provided with a penetrating point designed to enter the uppermost of said supported articles, and means for gyrating said
120 pitman for lifting said top article above said stop for permitting the forward feed of the same, substantially as described.

8. In a mechanism of the class described, the combination with a frame, means for folding
125 and pasting carton-blanks and means for feeding the same beyond the operating parts, of a vertically-movable table outside said feeding means designed to receive the cartons operated upon, a pivotally-supported
130 arm designed to rest upon the cartons fed to said table, and means for supporting said ta-

ble and automatically permitting its lowering as each successive carton is placed thereon, whereby the upper face of the top carton is always maintained in the same horizontal plane of the feeding mechanism.

5 9. In a mechanism of the class described, the combination with a frame, of a feeding-table, means for imparting a forwardly-moving tendency to the uppermost article supported by said table, a stop for preventing the forward feed of the article, and a pitman formed with a penetrating point for engaging the articles upon said table for lifting the said articles successively above said stop, substantially as described.

15 10. In a mechanism of the class described the combination of an article-supporting table, feeding means contacting with the said article, means preventing forward feed of said article, a pitman designed to engage the same, and means for gyrating said pitman for freeing said article for permitting its forward feed, substantially as described.

25 11. In a mechanism of the class described the combination with a suitable frame, carrying carton-blank-folding means, of a receiving-table mounted to move vertically in said frame, counterbalanced means supporting said table with the upper face of the top carton carried thereby in the horizontal plane of the discharge from said folding mechanism, and means for governing the position of the

folded cartons as they are fed to said table, substantially as described.

12. In a mechanism of the class described 35 the combination with suitable carton-blank-folding mechanism and a receiving-table for said blanks, of a weighted arm pivotally supported to swing in a vertical plane transversely of the said mechanism, the upper end of said arm extending above the outer end of said table for forming a stop for the cartons placed upon the table, substantially as described.

13. In a mechanism of the class described, 45 the combination with a suitable frame, of a feeding-table, means for imparting a forwardly-moving tendency to the uppermost article upon said table, a stop for preventing the forward feed of said articles, a pitman designed to engage the articles for lifting the same successively over said stop, and guiding means for said pitman whereby a forward as well as upward movement will be given the article operated upon, substantially as described. 55

In testimony whereof I hereunto affix my signature in presence of witnesses.

WALTER E. REULING.

Witnesses:

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H. D. HORST,
J. R. REULING.