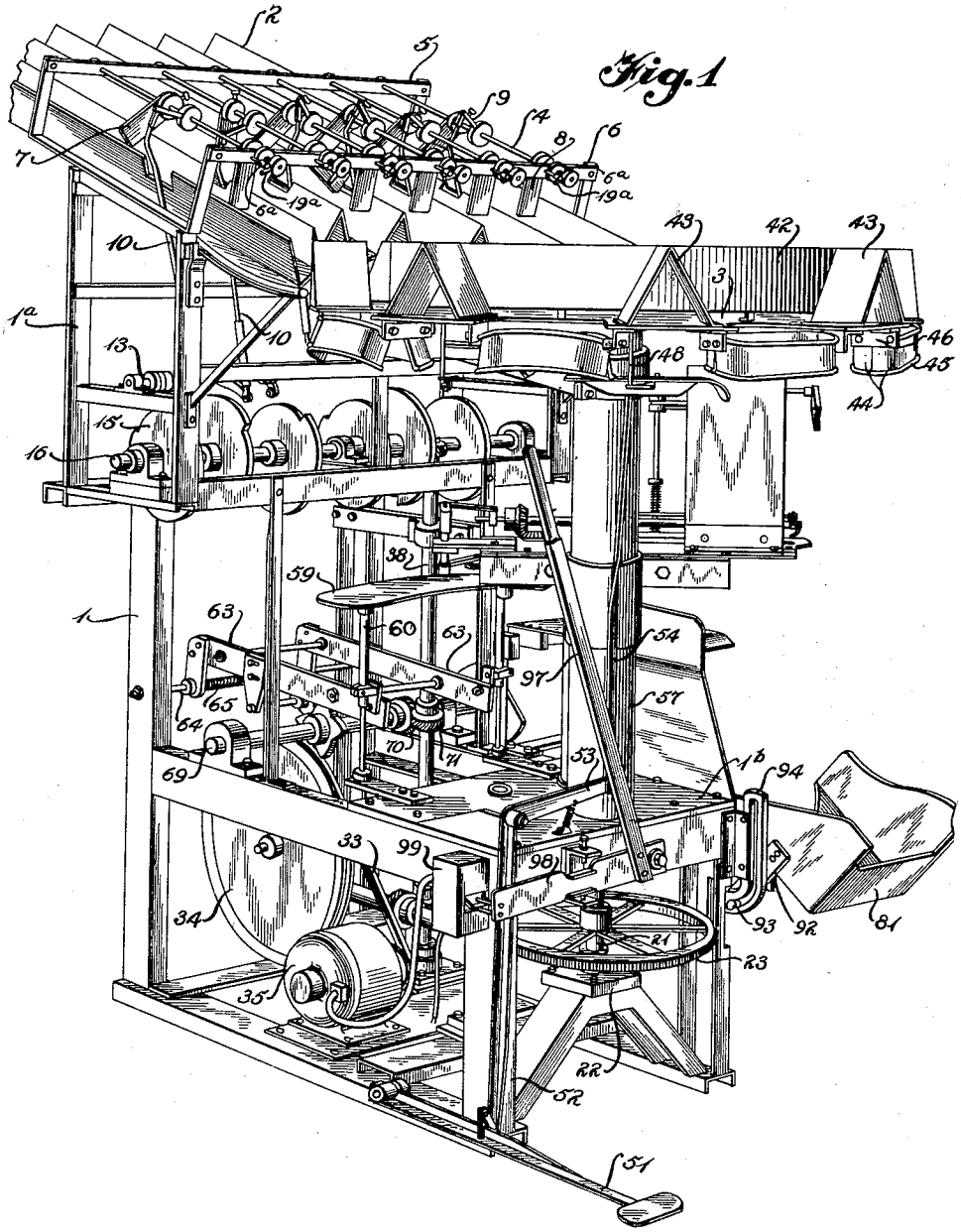
Dec. 1, 1953 E. E. WEST 2,661,132

BAG FILLING MACHINE WITH ROTATABLE BAG CARRIER HAVING EXPANDABLE AND CONTRACTABLE BAG ENGAGING FINGERS

Filed Sept. 24, 1948 5 Sheets-Sheet 1

Fig. 1



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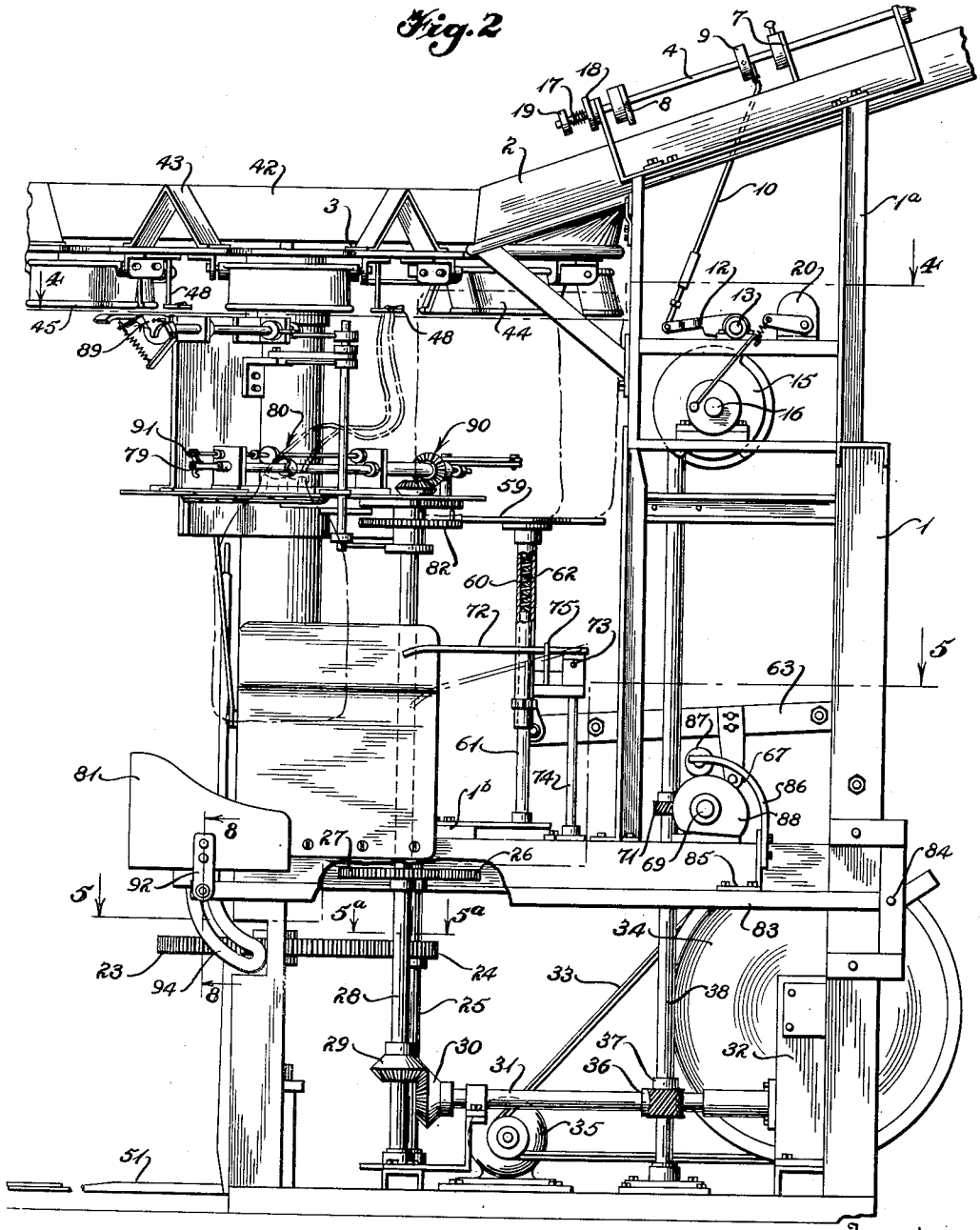
Attorneys

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BAG FILLING MACHINE WITH ROTATABLE BAG CARRIER HAVING EXPANDABLE AND CONTRACTABLE BAG ENGAGING FINGERS

Filed Sept. 24, 1948 5 Sheets-Sheet 2

Fig. 2



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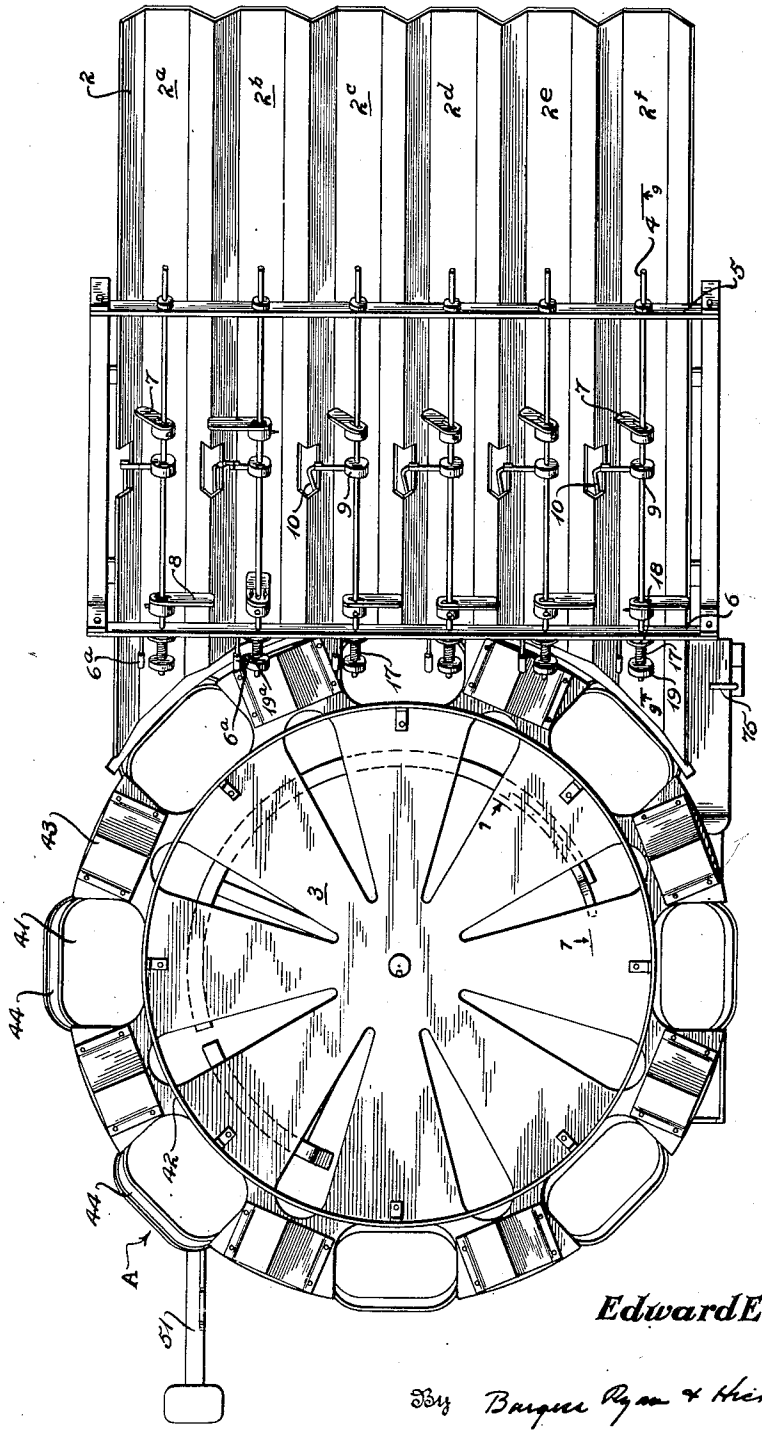
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BAG FILLING MACHINE WITH ROTATABLE BAG CARRIER HAVING EXPANDABLE AND CONTRACTABLE BAG ENGAGING FINGERS

Filed Sept. 24, 1948 5 Sheets-Sheet 3

Fig. 3



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BAG FILLING MACHINE WITH ROTATABLE BAG CARRIER HAVING EXPANDABLE AND CONTRACTABLE BAG ENGAGING FINGERS

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Fig. 4

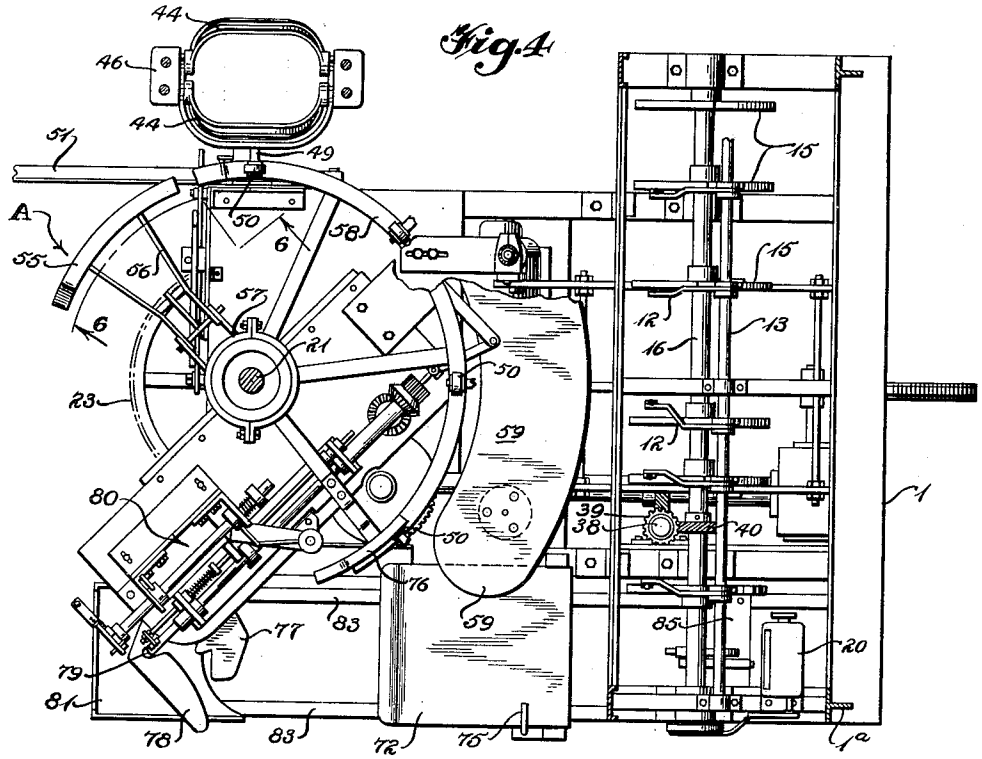


Fig. 5

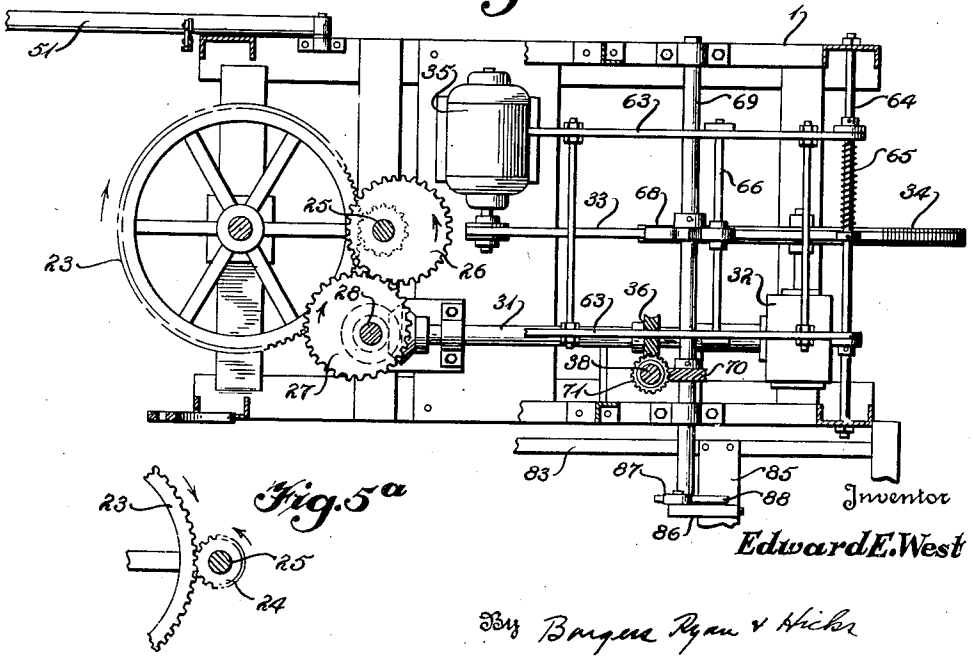


Fig. 5a

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BAG FILLING MACHINE WITH ROTATABLE BAG CARRIER HAVING EXPANDABLE AND CONTRACTABLE BAG ENGAGING FINGERS

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Fig. 6

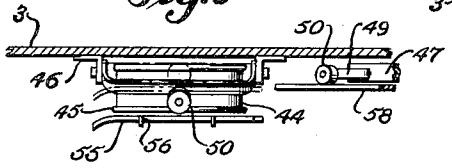


Fig. 7

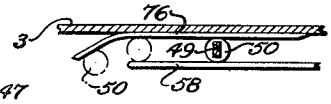
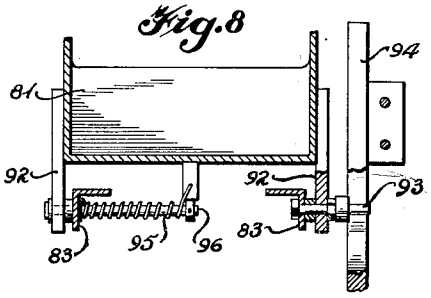


Fig. 8



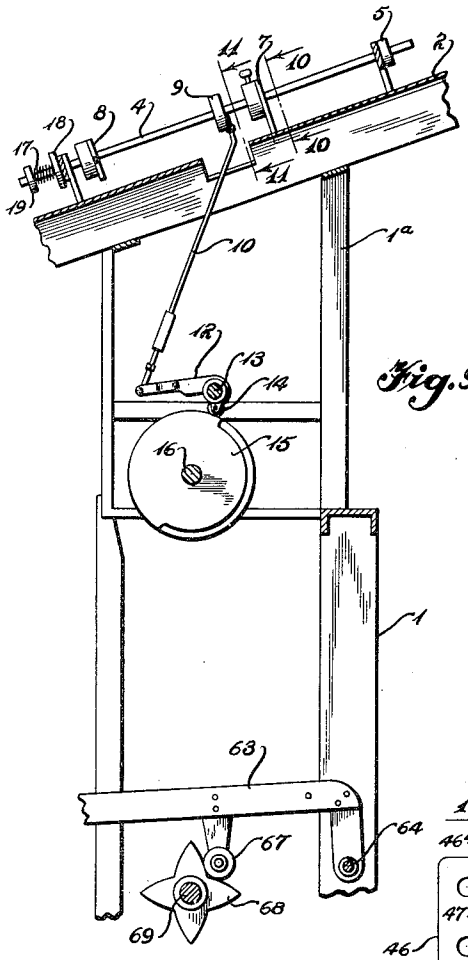
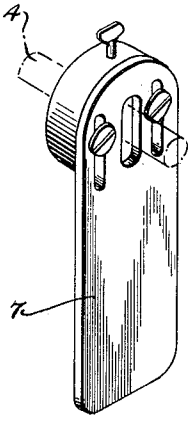


Fig. 9

Fig. 10



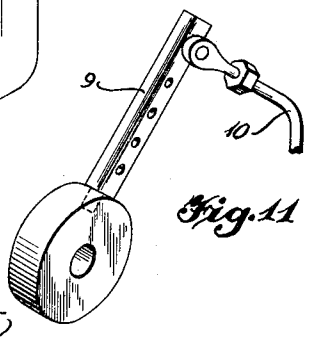


Fig. 11

Fig. 12

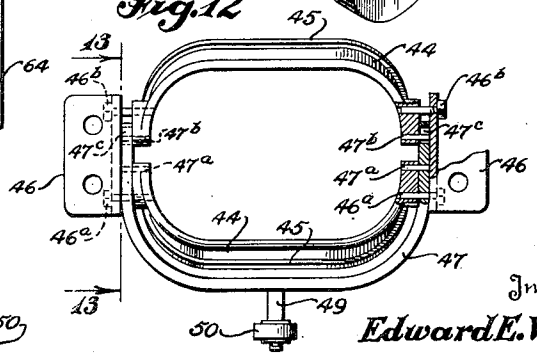
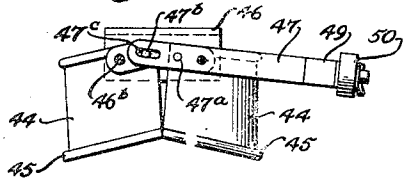


Fig. 13



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UNITED STATES PATENT OFFICE

2,661,132

BAG FILLING MACHINE WITH ROTATABLE BAG CARRIER HAVING EXPANDABLE AND CONTRACTABLE BAG ENGAGING FINGERS

Edward E. West, Richmond, Va., assignor to The Chase Bag Company, New York, N. Y., a corporation of Delaware

Application September 24, 1948, Serial No. 51,041

9 Claims. (Cl. 226—2)

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The present invention relates to improvements in bag filling machines and relates more particularly to a machine and method for continuously and automatically filling and tying drawstring bags of the consumer type with a number of articles such as citrus fruit or the like that closely approximate the weight of the contents stated on the bag.

The various objects and advantages of the invention will be apparent and best understood from the following description and the accompanying drawings in which:

Fig. 1 is a perspective view of a bag filling machine embodying the invention;

Fig. 2 is a side elevation of the bag filling machine illustrated in Fig. 1;

Fig. 3 is a plan view of the bag filling machine illustrated in Fig. 1;

Fig. 4 is a section view taken along the line 4—4 of Fig. 2;

Fig. 5 is a section view taken along the line 5—5 of Fig. 2;

Fig. 5a is a fragmentary view in section taken along the line 5a—5a of Fig. 2;

Fig. 6 is a fragmentary view in section taken along the line 6—6 of Fig. 4;

Fig. 7 is a fragmentary view in section taken along the line 7—7 of Fig. 3;

Fig. 8 is a section view taken along the line 8—8 of Fig. 2;

Fig. 9 is a section view taken along the line 9—9 of Fig. 3;

Fig. 10 is a perspective view on an enlarged scale of a delivery chute gate as seen from the line 10—10 of Fig. 9;

Fig. 11 is a perspective view on an enlarged scale of a delivery chute rock shaft operating lever as seen from the line 11—11 of Fig. 9; and

Figs. 12 and 13 are a plan and a side view, respectively, showing details of a bag holder operating mechanism.

The bag filling machine as illustrated herein has been shown and will be described in conjunction with the filling of open-mesh, consumer-type, drawstring bags with articles such as citrus fruit. However, it will be understood that bag filling machines embodying the present invention may be used for filling various types of bags with a variety of articles. As shown best in Figs. 1 and 2, there is a frame 1 supporting a framework 1a at one end thereof. The framework 1a supports a series of delivery chutes 2 in an inclined position.

In the illustrated bag filling machine six delivery chutes, identified by the reference numerals 2a, 2b, 2c, 2d, 2e and 2f have been provided, but, if desired, the number of delivery chutes may be changed as desired. The delivery chutes 2 are supported on the framework 1a with their lower or discharge ends positioned above a circular bag carrier 3 so that articles fed to the delivery chutes 2 will move down the chutes by gravity and will drop into bags supported on the bag carrier 3.

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Articles may be fed to the upper ends of the delivery chutes 2 in any suitable manner as from a feed hopper, such as a continuous conveyor belt or the like. In addition, separate feeding devices may be used to supply articles to the several delivery chutes 2 so that articles of various sizes and weights may be delivered from the several chutes to the bags that are being filled. The arrangement of the delivery chutes in such a manner provides a flexible unit that permits the user to select the sizes of the articles that are to be fed from the respective delivery chutes 2 in order to place the number of articles in the bag whose weight will be the closest possible approximation to the content weight stated on the bags and thus, avoid the overweight as usually provided for in automatic loaders.

The discharge ends of the delivery chutes 2 form a semi-circle so that they will be adjacent the circular bag carrier 3 at all points. Located above each of the delivery chutes 2 there is a rock shaft 4 that is supported in cross bars 5 and 6. The cross bars 5 and 6 extend across the series of chutes 2 and are supported at their ends from the framework 1a. Each of the rock shafts carries an upper gate member 7 and a lower gate member 8 that extend into the respective delivery chutes and control the flow of articles therethrough.

The gate members 7 and 8 are spaced from each other and are offset in relation to each other with one of the gate members blocking the delivery chute 2 when the other gate member is raised out of chute-blocking position. Thus, when the lower gate member 8 is raised, the articles in the chute between the gates may move down the chute and into a bag positioned beneath the chute. However, when the lower gate 8 is raised, the upper gate 7 blocks the chute to hold articles in the delivery chute 2 above the upper gate 7 from moving down the chute so long as the lower gate 8 remains open. When the lower gate 8 returns to its chute blocking position, the upper gate 7 is opened and articles again move down the chute until they strike the lower gate 8. The spacing of the gates 7 and 8

on the rock shaft may be adjusted so that the number of articles that will be released from a delivery chute 2 by opening the lower gate 8 may be controlled as desired.

As shown best in Fig. 9, the rock shafts 4 are operated by levers 9 that are connected by linkages 10 to bell crank levers 12. The bell crank levers 12 are pivoted on a cross shaft 13 that is supported by the framework 1*a* and the bell crank levers 12 are provided with cam rollers 14 that engage with cams 15. The cams 15 are carried by a cam shaft 16 located beneath the delivery chutes 2 and which is journalled in bearings supported on the frame 1.

The cams 15 are designed to cause the lower gates 8 to be opened and the upper gates 7 to be closed in the several delivery chutes 2 in appropriately timed relation to the movement of the circular bag carrier 3 and the passage of bags carried thereon beneath the discharge ends of the chutes 2. The opening of the lower gates 8 in this manner is opposed by return springs 17 of the torsion type. The return springs 17 are secured to the lower ends of the rock shafts 4 between members 18 fixed to the bar 6 and members 19 fixed to the shafts 4 and the tension of the return springs 17 may be adjusted as desired by turning the members 19 on the shaft 14. As soon as the cams 15 release the cam rollers 14 after opening the lower gates 8, the return springs 17 automatically return the lower gates 8 to their chute blocking positions where they are held by lugs 19*a* carried by the members 19 engaging with stops 6*a* extending from the bar 6.

If desired, a counting mechanism 20 may be secured to the cam shaft to record the number of rotations of the cam shaft 16 to enable the operator to determine the total number of articles delivered from each of the chutes.

As shown in Figs. 1 and 2, the circular bag carrier 3 is supported centrally on a vertically extending shaft 21. The shaft 21 is supported on a thrust bearing 22 and extends through a platform 1*b* extending between horizontal members of the frame 1. As shown best in Figs. 2 and 5, the shaft 21 is driven through a gear 23 that is secured to the shaft. The gear 23 meshes with a gear 24 that is secured to a vertical shaft 25. The shaft 25 also carries a driven gear 26 that meshes with a second driving gear 27 carried on a second vertical shaft 28 and in the illustrated embodiment, the gears 26 and 27 are eccentric. The shaft 28 is driven through a bevel gear 29 secured thereto and a bevel gear 30 secured to a horizontal drive shaft 31.

The drive shaft 31 is driven through a speed reducing gear box 32 that is in turn driven through a belt 33 and pulley 34 from an electric motor 35. The drive shaft 31 also carries a spiral gear 36 that engages with a spiral gear 37 carried on a vertical shaft 38. As shown best in Fig. 4, the vertical shaft 38 carries a spiral gear 39 that engages with a spiral gear 40 secured to the cam shaft 16 to drive the cam shaft 16 in properly timed relation to the movement of the circular bag carrier 3.

The eccentric gears 27 and 26 driving the circular bag carrier 3 impart a continuous movement at varying speeds to the circular bag carrier 3. This drive is arranged so that the circular bag carrier 3 will move very slowly when openings 41 in the carrier are beneath discharge ends of the delivery chutes 2; for example, as illustrated in Fig. 2. During this period of slow

movement, the lower gate 8 in the discharge chutes 2 that are above the openings 41 are opened, as previously described, and the articles in the delivery chutes 2 between the upper gate 7 and the lower gate 8 are permitted to fall out of the chutes 2 and through the openings 41 into the bags supported on the circular bag carrier 3 beneath such openings.

The circular bag carrier 3 is provided with a vertically extending annular rim 42 and sloping guides 43 that are positioned behind the openings 41 and at the sides thereof, respectively, to direct the articles falling from the delivery chutes 2 into the appropriate openings 41. Each of the openings 41 is defined by a pair of opposed semi-oval shaped bag holders or split collars 44 that are carried by the circular bag carrier 3 and on which a bag may be placed and held with the mouth of the bag open beneath the opening 41.

The bag holders 44 have raised ridges 45 at their lower edges that engage with the mouth of the bag placed thereon and thus prevent the bag from slipping off of the bag-holding collars when the opposed collars are inclined away from each other. The tops of bag holders 44 are pivotally secured at the ends of the collars to the vertically extending sides of angle members 46 that are in turn secured to the circular bag carrier 3. As shown in Figs. 12 and 13, each set of opposed bag holders 44 is provided with an operating yoke 47 that is pivoted on the supporting angle members 46. The yoke 47 is connected to the inner half of the bag holder 44 by pins 47*a* and to the outer half of the bag holder by pins 47*b* that extend into slots 47*c* in the end of the yoke 47 to accommodate movement of the outer half of the bag holder 44 as the yoke 47 is raised or lowered. By this arrangement, the bag holder 44 may be expanded into engagement with the mouth of a bag placed thereon when the yoke 47 is raised and will release the bag when the yoke 47 is depressed. An inwardly extending operating lever 49 with a track engaging roller 50 on its end is secured to the center of the yoke 47 for raising and lowering the bag holders 44.

When the bag holders 44 are expanded, the bag holders and the ridges 45 thereon engage with and hold the mouth of a bag that has been placed thereon in open mouthed position beneath the openings 41. Adjacent to each set of bag holders 44 there is a hook 48 supported from the circular bag carrier 3 and on which the looped end of the drawstring of the bag may be placed.

When the bag holders 44 reach the position indicated at A in Figs. 3 and 4 during the movement of the circular bag carrier 3, the lever 49 has been released and the bag removed from the holders 44, as will be described. With the bag holders 44 closed, at this point, the operator places the mouth of a bag around the closed bag holders 44 and steps on a treadle 51 connected through levers 52, 53 and 54 to a segment of track 55 that is positioned in back of the bag holders 44 and beneath the track engaging roller 50 on the end of the lever 49. The treadle 51 when depressed raises the segment of track 55 to the dotted line position shown in Fig. 6; thus, raising the lever 49 and expanding the bag holders 44 into engagement with the mouth of a bag placed thereon. This segment of track 55, as shown in Fig. 4, is supported on arms 56 that are pivotally supported on a casing 57 that surrounds the centrally located shaft 21.

As shown in Fig. 4, a fixed semi-circular section of track 58 is supported from the casing 57 that joins the movable segment of track 55. When the operator has placed a bag on the bag holders 44, he then holds the treadle 51 depressed until the movement of the circular bag carrier 3 engages the roller 50 on the end of the lever 49 with the semi-circular section of track 58. The semi-circular section of track 58 then holds the bag holders expanded so that the bags placed thereon are held in place for filling as they pass beneath the discharge ends of the delivery chutes 2.

As the bags thus held by the bag holders 44 come beneath the delivery chutes, the bottoms of the bags rest on a reciprocating jogging platform 59, that raises and lowers the bags as they are being filled to settle the articles that are being placed in the bags. The jogging platform 59 is supported, as shown best in Fig. 2, on tubular members 60 that telescope over rods 61 supported from the platform 1b. Springs 62 are located inside of tubular members 60 between the ends of the rods 61 and the tops of the tubular members 60 to cushion the downward movement of the jogging platform 59.

As shown best in Fig. 1, the tubular members 60 supporting the jogging platform are connected to arms 63 that are pivoted on a shaft 64 secured to the rear of the frame 1. The weight of the bags resting on the jogging platform 59 may be counterbalanced by a spring 65 that surrounds the shaft 64 with one end fixed to the shaft and its other end fixed to one of the arms 63. As shown in Figs. 5 and 9, a rod 66 extends between the arms 63 and at its center carries a roller 67 that engages with a star wheel 68. The star wheel 68 is secured to a cross shaft 69 that is journalled in bearings supported on the frame 1. The cross shaft 69 carries a spiral gear 70 that is driven by a gear 71 on the vertical shaft 38 driving the cam shaft 16. In this manner the jogging platform 59 is raised by the star wheel 68 raising the arms 63 through its engagement with the roller 67.

As a bag that has been filled is carried from beneath the delivery chutes 2, it is also moved from the jogging platform 59 onto a tiltable platform 72. The tiltable platform 72 is supported on a shaft 73 that extends between two supports 74. The tiltable platform 72 is biased to a horizontal position by a spring (not shown) and a stop 75 prevents the platform from going above its horizontal position. As the circular bag carrier 3 continues to move, the top of the roller 50 on the end of the lever 49 for operating the bag holders 44 is brought into engagement with a segment of track 76 that joins the end of the semi-circular track 58 and has a downwardly inclined end as shown in Fig. 7. The downwardly inclined end of the track 76 directs the lever 49 downward as the roller 50 leaves the track 58 and insures that the bag holders will close and release the filled bag at this point.

When the filled bag is released by the bag holders 44, the filled bag is supported on the end of the tiltable platform 72 which tilts downwardly under the weight of the bag and permits the bag to drop down gently without sudden jerks that might break or damage the drawstring. During this downward movement of the bag, the drawstring of the bag which is held in the hook 48 is drawn tight by the weight of the bag so that the mouth of the bag is closed. As the bag

which is now suspended by its drawstring with its mouth closed from the hook 48 on the bag carrier 3 continues to move, the drawstring is brought into engagement with guide fingers 77 and 78 that position the drawstring for engagement by a rotatable looper 79 of a suitable knot tying mechanism indicated generally at 80 while the bag itself is delivered to a reciprocating hopper 81.

The knot tying mechanism 80 illustrated herein is the subject of my copending application Serial No. 51,042 filed September 24, 1948, and reference may be made thereto for a detailed description of this mechanism and its operation. However, it may be noted that the knot tying mechanism 80 is driven by a gear 82 that is secured to the vertical shaft 28 which is driven from the drive shaft 31 and which carries the eccentric gear 27.

As shown best in Fig. 2, the hopper 81 is supported on arms 83 that are pivoted on a shaft 84 at the rear of the frame 1. A cross piece 85 extending between the arms 83 carries an upwardly extending curved member 86. A cam follower 87 carried by the curved member 86 engages with a cam 88 carried on the end of the cross shaft 69 which also carries the star wheel 68. The cam 88 is designed to raise the arms 83 and thus, the hopper 81 and the bag carried therein in properly timed relation to the operation of the knot tying mechanism so as to relieve the tension in the drawstring as the looper 79 is rotated to permit the drawstring to be looped around the body of the looper 79. The arms 83 may be spring loaded by a spring (not shown) surrounding the shaft 84 to counterbalance the weight of the bag carried by the hopper 81 at the ends of the arms 83 thus, relieving the strain on the operating parts in lifting the arms 83.

As the drawstring of the bag is brought into engagement with the looper 79 and prior to the rotation of the looper 79, the continued movement of the circular carrier 3 brings the looped end of the drawstring into engagement with a set of drawstring holding fingers indicated generally at 89 where the drawstring is held so that further movement of the bag carrier 3 causes the looped end of the drawstring to be slipped from the hook 48 and onto the fingers 89 where it is held in proper position for the knot tying operation.

As the hopper 81 is raised, the looper 79 is rotated through gearing indicated generally at 90 and the drawstring is wrapped around the body of the looper to form a loop therein. After the drawstring has been wrapped around the looper 79, a reciprocable hooked member (not shown) located inside of the looper 79 engages with the drawstring extending from the fingers 89 and then draws a portion of the drawstring engaged thereby inside of the body of the looper 79 and at the same time pulls the end of the drawstring from the fingers 89. When this has been done a doffer 91 is operated to push the portion of the drawstring wrapped around the looper 79 from the looper body and thus, over the portion of the drawstring that has been drawn into the looper body by the hook as previously mentioned. When this happens the hopper 81 is permitted to descend under the weight of the bag and under the control of the cam 88 so that the portion of the drawstring that was wrapped around the looper 79 is drawn tight and forms a knot. Thereafter, the reciprocating hook inside of the looper 79 releases the loop that it has drawn in the draw-

string and the bag is ready to be discharged from the hopper 81.

As shown in Fig. 8, the hopper 81 is carried on supports 92 that are pivotally mounted on the arms 83 and as shown best in Fig. 1, a lug 93 carried by the inner support 92 engages with a slot in a guideway 94. The guideway 94 thus controls the angular position of the hopper 81 with respect to the arms 83 and is designed to hold the hopper level during the movement of the arms 83 above the horizontal position. However, when the arms 83 and the hopper 81 move below their horizontal position under the weight of the filled bag after the knot has been tied, the guideway 94 causes the hopper 81 to be tilted outwardly, as shown in Fig. 1, to discharge the bag therefrom onto a conveyor belt (not shown) or other suitable arrangement for transporting the filled bags from the machine.

Also as shown in Fig. 8, the hopper 81 is spring loaded by a torsion spring 95 that surrounds a shaft 96 on which one of the supports 92 is pivoted to one of the arms 83. One end of the spring 95 is secured to hopper 81 while the other end is secured to the arm 83 and the spring tends to return the hopper 81 to a level position. When the bag is discharged from the hopper 81, the spring loaded arms 83 under the influence of the cam 88 return to a horizontal position where the hopper 81 is held level by the guideway 94 and the spring 95 to receive the next bag.

A control lever 97 may be provided to control the operation of the electric motor 35 and to start and stop the machine thereby as desired. The control lever 97 is connected by a lever 98 pivoted on the frome 1 to a switch operating mechanism 99 that connects the motor 35 to a source of electrical energy.

While a circular bag carrier 3 that has provision for holding eight bags thereon has been illustrated and described, it will be understood that other types of continuously driven bag carriers with provisions for holding different numbers of bags thereon may be used if desired. For example, a bag carrier in the form of an endless chain or belt may be used. In the machine as described herein, three of the bags are supported with their mouths open beneath the discharge ends of the delivery chutes but it will be understood that any desired number of delivery chutes and bags may be employed and by filling the bags in this manner, a predetermined number of articles of selected weight may be fed from each of the delivery chutes to the bags as they pass beneath these chutes. This arrangement also permits the bag filling operations to be carried out as quickly as the knot tying mechanism or other bag closing mechanism can operate to close the filled bag. This avoids the delays involved such as when a single bag is filled from a single delivery chute and thereby increasing the overall productive capacity of the bag filling machine.

It will be understood that knot tying mechanisms other than that one illustrated and described herein may be used in a machine of this type if desired. It will also be understood that various modifications and changes may be made by those skilled in the art in the bag-filling machine illustrated and described herein without departing from the scope of the claims as appended hereto.

I claim:

1. In a bag filling machine of the type described wherein a bag is filled with a predetermined number of articles of selected sizes and weights and after being filled the mouth of the bag is closed by the drawstring thereof with the drawstring thereafter being secured to keep the mouth of the filled bag closed, the combination which includes a rotatable circular bag carrier, a plurality of bag holders supported by said bag carrier at its outer periphery, each of said bag holders defining an opening and being movable into and out of engagement with the mouth of a bag placed thereon and being adapted to support said bag in open mouthed position beneath said opening, a plurality of delivery chutes having their discharge ends located at spaced points about the outer periphery of said bag carrier and adjacent the openings defined by a plurality of the bag holders whereby articles may be simultaneously delivered from a number of said chutes to a plurality of bags carried by said bag carrier, a drive connected to said circular bag carrier for driving said carrier continuously with the bags carried passing beneath said delivery chutes, operating levers having connections to each of the bag holders for moving the same into and out of engagement with the bags placed thereon, a segment of track pivotally mounted beneath said bag carrier at a point in advance of said delivery chutes, said segment of track being engageable with the operating levers for the bag holders to move said bag holders into engagement with the mouth of a bag placed thereon, a semi-circular section of track supported in fixed position beneath said bag carrier opposite the delivery chutes and adjoining said pivoted segment of track, said semi-circular portion of track engaging with the levers and holding said bag holders in engagement with the bags during the movement of the bag carrier and the bags carried thereon beneath the delivery chutes, and a sloping section of track supported in fixed position beneath said bag carrier and adjoining said semi-circular section of track, said sloping portion of track engaging with the operating levers for the bag holders after the bags held thereon have been filled to retract said holders and release the filled bags therefrom.

2. In a bag filling machine the combination as defined in claim 1 which includes means for intermittently releasing a predetermined number of articles from said delivery chutes as the bags carried by said bag carrier pass beneath said delivery chutes.

3. In a machine for filling a bag having a drawstring closure with a predetermined number of articles and then closing the mouth of the bag by the drawstring, the combination which comprises a bag carrier, said bag carrier being rotatable, a series of bag holders carried in spaced relation to each other on the bag carrier, each of said bag holders comprising a pair of expandable members, said members being movable into and out of engagement with the inside of a bag and defining an opening communicating with the mouth thereof, drawstring engaging means on the bag carrier adjacent each of said bag holders, a series of delivery chutes having their discharge ends located at spaced points about the bag carrier and adjacent the openings defined by the bag holders, vertically movable means for moving the expandable member into engagement with the bag, said movable means being located in advance of the delivery chutes in the movement of the bag carrier, means for holding the bag holders in engagement with the bag, said last-mentioned means having an end adjoining the movable means and extending beneath the

delivery chutes, a release mechanism in each of the chutes for releasing a predetermined number of articles from the chutes to the bags supported on the bag holders passing beneath the respective chutes, means for releasing the bag from the expandable members and suspending the bag on the carrier by the drawstring, said release means being operable by the weight of the bag and being located at a point following the discharge chutes in the movement of the bag carrier and a drive for continuously rotating the bag carrier and for operating the release mechanisms in the discharge chutes in timed relation to the rotation of the carrier.

4. In a machine for filling a bag having a drawstring closure with a predetermined number of articles and then closing the mouth of the bag by the drawstring, the combination as defined in claim 3 wherein the drive for continuously rotating the bag carrier includes a pair of eccentric gears, said gears varying the speed of the carrier during its rotation.

5. In a bag filling machine for automatically filling and closing a drawstring bag with a predetermined number of articles of selected sizes and weights closely approximating a stated content weight for the bag, the combination which includes a rotatable bag carrier, a series of bag holders supported in spaced relation on said bag carrier, said bag holders being movable in a common path of travel by said carrier, each of the bag holders comprising a pair of opposed expandable members, each pair of said members being movable into and out of engagement with the inside of a bag placed thereon and defining an opening communicating with the mouth thereof, vertically movable means for expanding said members into engagement with the bag, means for holding said members in engagement with the bag and supporting the bag in open-mouthed position on the carrier, a drawstring-engaging member associated with each of said bag holders, a series of delivery chutes having their discharge ends located at spaced points about said bag carrier and adjacent openings defined by a number of the bag holders thereon, means for substantially simultaneously releasing articles from each of said chutes to each of the bags supported by bag holders as said holders pass beneath the respective chutes, means for releasing the expandable members from engagement with the bag and suspending the bag from the carrier by its drawstring after movement of the bag beneath the delivery chutes and the knotting mechanism positioned in the path of movement of the carrier, said knotting mechanism including a drawstring engaging member positioned to engage with and release the drawstring of a filled and closed bag from the carrier.

6. In a bag filling machine for automatically filling and closing a drawstring bag with a predetermined number of articles of selected sizes and weights closely approximating a stated content weight for the bag the combination as defined in claim 5 which includes a common drive for continuously rotating the bag carrier, operating the release means in the discharge chutes and the knotting mechanism.

7. In a bag filling machine for automatically filling and closing a drawstring bag with a predetermined number of articles of selected sizes and weights closely approximating a stated content weight for the bag, the combination as defined in claim 5 which includes means for continuously rotating the bag carrier and varying the speed thereof as bags pass beneath the discharge chutes.

8. In a machine for filling and closing a drawstring type of bag, the combination which includes a rotatable bag carrier, a plurality of bag holders supported by said bag carrier at its outer periphery, each of said bag holders including a pair of expandable members pivoted in opposing relation to each other and defining an opening corresponding in size and shape to the mouth of a bag supported thereon, an operating lever having connections to each of said pivoted members for moving the same into and out of engagement with the inside of a bag, a drawstring engaging member on the carrier adjacent each of the bag holders, a vertically movable segment of track located beneath the rotatable bag carrier at one point in the path of movement thereof, said movable segment of track being engageable with the operating levers on the bag holders upon vertical movement thereof for expanding the bag holders into engagement with a bag placed thereon, a horizontal section of track supported in fixed position beneath said bag carrier and adjoining said movable segment of track in the raised position thereof, said horizontal portion of track engaging with the operating levers and holding the expandable members in engagement with the bag during a portion of the movement of the carrier and a downwardly sloping section of track adjoining said horizontal section of track, said downwardly sloping section of track permitting the operating levers of bag holders to move downwardly under the weight of the bag to release the expandable members from engagement therewith and to suspend the bag from the carrier by its drawstring.

9. In a machine for filling and closing a drawstring type of bag, the combination as defined in claim 8 which includes manually operable means for moving the movable segment of track vertically into engagement with the operating levers on the bag holders.

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